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CACTUS AND SUCCULENT JOURNAL

VOL. XXXIII MARCH-APRIL, 1961 NO. 2

Fig. 12
Agave attenuata. Grown by the University of California. Approx. 1/14 natural size. See page 36.

CACTUS AND SUCCULENT JOURNAL

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PRESIDENT'S MESSAGE

By now every member of the Cactus and Succulent Society of America, Inc., should have received full details on the forthcoming Ninth Bi-ennial Convention in Mexico this coming July 12th through 17th. As noted in the Reservation Form, the deadline is April 15th, 1961. The reason for this early deadline is because we must have full reservation and total payments into the hotels sixty days ahead of the convention date in order to hold the rooms needed. I hope everyone will send their money in as early as possible.

As the Information Sheet indicated, plant collecting will be very limited, therefore we suggest taking your camera and lots of film along. There is plenty to take and you will really have something to show for it, especially if you follow some of the suggestions taken from Eastman's Booklet, "Vacations South of the Border, with your color camera." It is suggested in the following South-of-the-Border picture situations you use ½ stop less exposure than the normal for the reasons stated:

People. In the tropics, people wear lighter colored clothes, to reflect the sun and to help keep cool, so large groups of these light clad people would reflect more light.

Buildings, both commercial and residential, are customarily white or pastel shades. Again more reflections.

Landscape foregrounds such as those found in the plains areas of Mexico, for example, are lighter—about ½ stop more—than the average landscape of New York state or Minnesota.

Foliage (sometimes near dusty roads, which make it even lighter) is about ½ stop lighter in tone than that found in the central and northern parts of the United States.

Poolsides or sandy ocean beaches are both notoriously bright areas.

Remember the sun is not brighter, its the same sun that's shining all over the world, but there is a difference in sun angle and average subject brightnesses that accounts for our change in the basic exposure recommendations. If the sun doesn't shine, and during the summer "rainy" season, the sun shines an average of only 40 percent of the day; so, if you don't use a light-meter, memorize two basic camera settings, one for brilliant sunshine and the other when the sun is behind the clouds. The average large-cloud shadow causes about a 2-stop loss in exposure—no more.

In taking pictures of the people, we recommend, especially for closeups, that you ask first and then take the picture afterwards. Don't be afraid to pantomime if there is a language problem, sign language is truly universal. A smile can work wonders, a model fee may also help. Two words of real advice here; If a small model fee is necessary, take the picture first and pay afterwards. Secondly, don't be excessively generous, giving a comparatively large model fee will be really the wrong thing to do in terms of local employer-employee relationships and also from the standpoint of visitors who will follow you. Ask the desk man at your hotel or local shopkeepers and guides for appropriate rates on these affairs.

During your trip to the University of Mexico Campus be sure and photograph the intricate mosaics as well as the fine cacti and succulents. Use plenty of film in the valley of the old men cactus, your friends at home won't believe you when you tell about this fine stand of Ceplocereus senilis and their amazing heights. The Hotel Penafiel in Tahuacan is outstandingly photographic and the country around there is the heart of the cactus country in Mexico. See how many plants you can photograph while you are in Mexico, they will give your club many programs in the months to come.

If it should be warm and humid during your stay, protect your exposed film by storing it in its original metal container, but be sure and remove the neoprene gasket from the inside of the lid, throw it away and screw the lid on loosely. This will allow the container to "breath" somewhat and help to lessen the moisture content.

Incidentally, did you know that there are Kodachrome Processing Laboratories at both ends of the South-of-the-Border area. In Mexico City and also in Panama? Ektachrome can be processed locally also. If your only going to be in Mexico for two or three weeks, there's no real necessity for shipping your films home for processing. That is, unless you want to look at your pictures the same day you return. If you run out of film on your trip, Kodachrome Film is sold almost everywhere at a price that includes processing at any Kodak Processing Laboratory.

Hoping to see many Cactus and Succulent Society of America members (and their cameras) next July.

EDWARD S. "TED" TAYLOR, *President*

CULTIVATED AND NATIVE AGAVES IN THE SOUTHWESTERN UNITED STATES

AUGUST J. BREITUNG
1416 S. Glendale Ave., Glendale, California

PART 13

Fig. 13
Agave vilmoriana. Left: Rosette grown by Lida Delap, Covina, California, approx. 1/12 natural size; Right: inflorescence grown by George Glade, Tujunga, California, greatly reduced.

Agave vilmoriana Berger, Repert. Nov. Sp. Fedde 12: 503, 1913.

A. mayoensis Gentry, Carn. Inst. Wash. Publ. 527: 94, plate 6, fig. 1: plate 14, fig. 1, 1942.

Distribution: Type cultivated in Europe, thought to be introduced from Jalisco; Chihuahua to Arroyo Gochico near San Bernardo, Sonora, the type locality of *A. mayoensis*.

Rosette 1.60 m. in diameter, single, leaves narrowly linear-lanceolate, acuminate, 7 to 15 dm. long, 7 to 12 cm. wide, bluish or glaucous, softly fleshy, margin entire, spine slender, subulate, shortly decurrent 3 to 4 mm. long; flower stalk 4 m. high, bracts linear, 1 to 3 dm. long, flowers in a dense spicate racemose cluster 2.5 m. long, perianth yellowish-white, funnelform, 15 mm. long; bulbils numerous. March-May.

Agave chrysoglossa I. M. Johnston, Proc. Calif. Acad. Sci. ser. 4, 12: 998, 1924.

Distribution: Mexico; Sonora, San Pedro Nolasco Island, Gulf of California, the type locality.

Rosette single, 0.2 to 1.5 m. in diameter; leaves 5 to 15 dm. long, 4 to 6 cm. wide, linear-lanceolate, spine pale yellowish brown, becoming gray, decurrent for 2 to 3 dm. and confluent with the narrow, horny, straight, unarmed leaf margin ending 2.5 cm. above the base, remainder is minutely denticulate; inflorescence 2.2 to 3.1 m. high, erect or bent over, the dense elegant spicate cluster 1 to 2 m. long, perianth bright yellow. March-April.

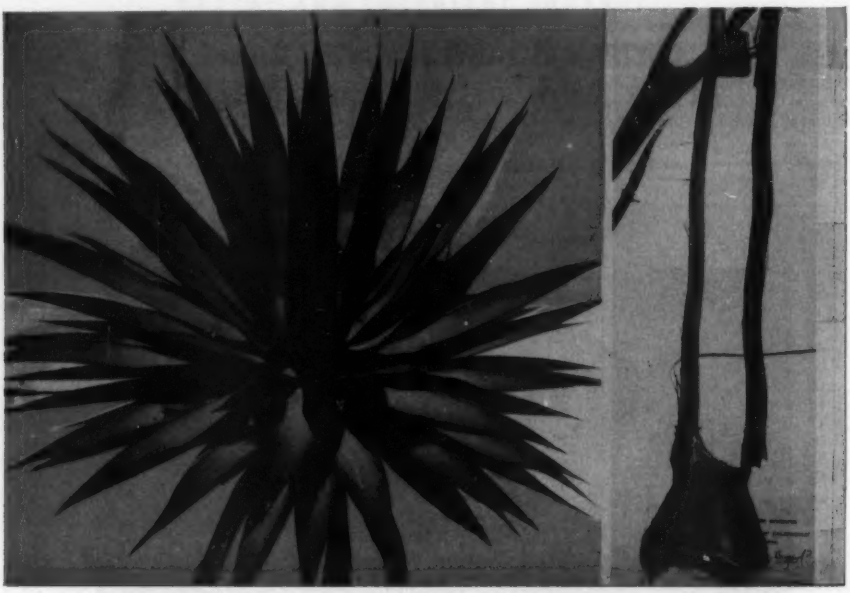

Fig. 14

Agave chrysoglossa. Left: rosette grown by Bob Los Flores, Salinas, California, approx. 1/10 natural size; introduced from San Pedro Nolasco Island, Gulf of California, Sonora.

Right: leaf detail of herbarium sheet, collected at San Pedro Bay, Sonora, by I. M. Johnston, No. 4338, California Academy of Natural Sciences, San Francisco, California.

Agave attenuata Salm-Dyck, Hort. Dyck, 7: 303, 1834.

A. glaucescens Hook. in Curtis' Bot. Mag. 111. 18: pl. 5333, 1862.

A. cernua Berger, Die Agaven, 122, 1915.

Distribution: Mexico; Hidalgo, type cultivated in Europe (from about Real Del Monte?).*

Rosette 1 to 2 m. in diameter, 15 to 35 leaved surmounting a trunk 1 to 1.5 m. long, often branched at the base, leaves 6 to 10 dm. long, 15 to 20 cm. wide, soft, glaucous, unarmed, without spine or prickles; scape short, covered with long attenuate bracts; flowering spike dense, 3 to 4 m. long, elegantly recurved, sometimes very bulbiferous in age, flowers greenish white, 6 cm. long including the ovary, perianth segments 22 to 24 mm. long, 4 to 5 mm. broad, linear lanceolate. Dec.-Jan.

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*Cactus Slim Moorten advised the writer that *Agave attenuata* occurs wild in a canyon in Mil Cumbres area. Dr. Howard S. Gentry, personal correspondence, states: "Mil Cumbres is a mountainous area in the state of Michoacan. The highway from Guadalajara to Mexico City winds scenically among the many peaks of the region. At one point along this road I also observed *Agave attenuata* growing spontaneously on a rocky cliff and adjacent rocky slopes. It is the only locality where I have observed *A. attenuata* growing wild."

Fig. 15

Agave attenuata. Grown by Peter Kinghorn (Center), Glendale, California. Inflorescence about 4 m. long having over 10,000 flowers. Approx. 1/14 natural size. Courtesy, Glendale Independent Newspress.

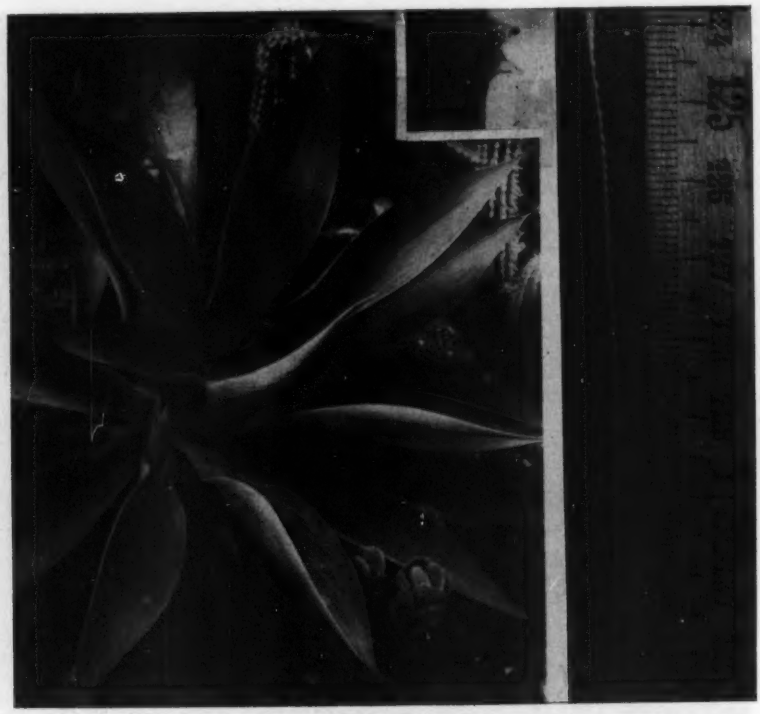


Fig. 16

Agave attenuata var. *serrulata*. Grown and photographed by J. Marnier-Lapostolle. Rosette approx. 1/6 natural size; leaf margin with rule enlarged x 1.6; inset enlarged x 14.

Agave attenuata var. **serrulata** Terracciano, Primo contributo ad una monografia delle Agave, Napoli, 21, 1885.

A. cernua var. *serrulata* (Terracc.) Berger, Die Agaven, 123, 1915.

Distinguished from the typical species by the lower half to two-thirds of leaf margin with close set minute denticles. Living specimens contributed by J. Marnier-Lapostolle.

FROM NEW YORK

Dear Editor:

While studying the latest Cactus & Succulent Book List issued by the Abbey Garden Press I was struck by several omissions. Where for instance is that favorite classic of our childhood, "Black Rebeautya"? Also among the missing is a more recent work, "How Green Was My Aloe". And what about "Lady Chatterley's Lobivia"—this work achieved wide notoriety by being banned by the Post Office because some passages were deemed too succulent for the general reader. And nowhere to be found in the listing are two of the greatest works in English literature—Milton's "Parodias Lost" and DeQuincy's "Confessions of an English Peyote Eater". And not to be forgotten is that epic tale, "Two Years Before the Echinomastus".

No doubt fellow bibliophiles will have some forgotten titles of their own.

JOSEPH EMMA

TED TAYLOR

EDITOR'S NOTE: Your president is a Past President of the Southern California Council of Camera Clubs, composed of about eighty clubs, and is at present District Representative of the Photographic Society of America, the largest photographic hobby group in the world. He is also Chairman of the P.S.A. Roundup Nature division.

CORRECTIONS

Please make the following corrections in the By-Laws printed in the last issue of the Journal:

Article IV, Board of Directors. Section 1, 2nd paragraph "June the thirteenth" should read "June the Thirtieth."

Article VI, Membership Meetings. Section 1, Annual meeting, "September the Thirteenth" should read "September the Thirtieth."

Article IX, Affiliated Societies. Section 2, Remove "for adequate cause" from the end after, "Inc."

Fig. 17
Ortegocactus macdougallii Alexander, in natural habitat near San José Lachiguirí, State of Oaxaca, Mexico. ½ nat. size.

Ortegocactus, a Unique New Genus

By E. J. ALEXANDER

Some years ago Mr. T. MacDougall brought back from Mexico an odd-looking cactus which in some ways resembled a Coryphantha, and in some ways a Mammillaria. It was sufficiently different from either in still other ways to suggest waiting for flowers and fruits before making a positive identification. These having now been obtained, it is evident that this plant cannot be fitted into any hitherto known genus, and accordingly it is here described as representing a new and anomalous genus of the subtribe Coryphanthanae.

Ortegocactus Alexander, gen. nov. Corpus plantae caespitosa vel simplex; tuberculi valde depressis spiraliter disposita; areolis magnis in pars superiore gerens tomentum aculeis radialibus pluribus, centrali uno porrectis; flores infundibuliformes ex axillis tuberculorum; ovarium esquamatum, sed cum lana prolixa et mollis, bacca sicca sparse lanata coronata periantho desiccato indehiscens; semina minuta nigra et minute punctatae.

Plant-body globose to short-cylindric, rather small, usually caespitose (rarely simple), the tubercles much flattened in close spiraled arrangement, comparatively large, areoles nearly central, bearing wool at the upper part and with numerous spines. Flowers arising from the axils of the upper fully developed tubercles, funnelform-spreading, the ovary covered with a growth of long, soft white wool. Fruit crowned by the dried persistent perianth and thinly covered by the persistent wool, apparently indehiscent and long persistent. Seeds less than 1 mm. long, black, the surface pitted, hilum elongate, basal.

Ortegocactus macdougallii Alexander, sp. nov. Corpus plantae globosus vel subcylindricus caespitosus vel simplex griseo-viridis pallidus 3-4 cm. in diametro, tuberculi magni 10-12 mm. in diametro rhomboidali valde depressis punctati, spiraliter disposita proximati, areolis subcentralis 2 mm. in diametro, lanuginosi breve in pars superioris, aculeis nigris ad subalbis cum apices nigris, radialibus 7-8, 5-10 mm. longis, centralibus 1, 4-5 mm. longis: flores diurni in sole 20-30 mm. longis et 18-25 mm. latis, tubi brevi pallide viride, fauci infundibuliformi, lobis patentis, spatulatis obtusis apice erosis, lobis exterioribus brevioribus, phoeniceo-tinctis exteriore, luteis interiore; lobis interioribus omnibus luteis; staminibus numerosis, auranteis brevioris quam perianthii; ovarium lanis mollis albis longis; stylis luteo-viridis, stigmatibus 4, erectis viride saturati: fructus parce lanatus indehiscentis,

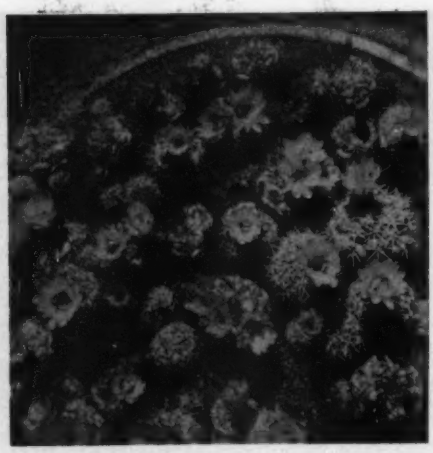


Fig. 18
Ortegocactus macdougallii Alexander, flowering in a hotel patio in Mexico. ¼ nat. size.

seminibus 0.9 mm. in diametro, punctatis, nigris.

Plant globose to short cylindric, usually caespitose but sometimes simple, light gray-green, 3-4 cm. in diameter; tubercles comparatively large and much flattened, rhomboidal, 10-12 mm. in diameter, punctate, spirally arranged in closely interlocking style; areoles nearly central 2 mm. in diameter bearing short wool in their upper portion, spines black to whitish with black tips, radials 7-8, 5-10 mm. long, centrals 1, 4-5 mm. long; flowers expanding diurnally in the sun, 20-30 mm. long and 18-25 mm. across when expanded, with a short pale green tube and funnelform throat, the lobes spreading, spatulate-obtuse with erose apex, 7-8 outer lobes ⅓-½ as long as the 25+ inner ones, the outer ones purple-tinged on the outside, yellow within, the inner ones all clear yellow; stamens numerous, much shorter than the perianth, orange; pistil almost as long as the perianth, style greenish yellow, the stigmas 4, linear erect, deep green: ovary not bearing scales but covered with a growth of long soft white wool; fruit dry, globose-ellipsoid, dull red, thinly matted with persistent wool, apparently indehiscent, seeds globular or nearly so, 0.9 mm. in diameter, pitted, black, hilum elongate, basal.

Type: Plants collected by T. MacDougall in the winter of 1951-2 and again in the winter of 1955-6 near the village of San José Lachiguirí, State of Oaxaca, Mexico, and flowered in a hotel patio in Tehuantepec, Mexico in January 1952 and March-April 1956. Type deposited in the Herbarium of The New York Botanical Garden. This new genus is named to honor the Ortega family of San José Lachiguirí, several of whom aided Mr. MacDougall in the discovery of the plant. So far it is known only from the type locality where it grows on limestone rock accompanied by a shrubby growth of Baccharis and Arctostaphylos. The flowers are open for two successive days.

The presence of a plant with a wooly ovary in the subtribe Coryphanthanae may be disturbing to some, but the axillary flowers and spiraled tubercles are such strong characters as to exclude it from any other placement. This is further strengthened by the form and structure of the flowers and seeds, which are strikingly similar to Dolichothele as well as to some Mammillarias and Coryphanthas. The main difference is in the wooly ovary, which keeps the plant distinct from the rest of the subtribe. Within that subtribe the new genus is nearest to Dolichothele, but differing in the wooly ovary and strongly flattened tubercules, and regardless of whether or not Dolichothele is merged into Mammillaria, this new genus must remain in that relationship.

E. J. ALEXANDER
New York Botanical Garden

SOUTH BAY CACTUS AND SUCCULENT CLUB

The club meets on the second Friday of each month, at the Lawndale Community Center, 147th Street and Burin Avenue, Lawndale, California, and welcomes visitors at all meetings.

Officers for 1960 were Mrs. John B. Stanton, president; Mrs. John Cody, vice-president; John B. Stanton, secretary; and Mrs. Lynn Blankenship, treasurer.

At the January meeting, the 1961 officers were installed by Joe Taylor, superintendent of parks of the city of Redondo Beach, as follows: Robert Marshall, president; John B. Stanton, vice-president; Mrs. John B. Stanton, secretary; Mrs. Roy Vroom, treasurer; and Mrs. Edna Kelly, registrar.

The club is planning its first Annual Cactus and Succulent Show, which will include Epiphyllums, to be held at the Lawndale Community Center, Saturday, May 13, from 2 to 10 p.m., and Sunday, May 14, from 10 a.m. to 8 p.m. Everyone is invited to display plants (which may be entered Friday between 7 and 10 p.m., or Saturday before 10 a.m.—trophies and ribbons will be awarded) and to see the show.

COLORADO CACTOPHILES ELECT NEW OFFICERS

At the January meeting of the Colorado Cactophiles the membership elected new officers and planned for a year of increased organizational activity with a stepped-up educational program.

Officers elected were: Maryann Heacock, President; Frank Stiles, vice president; Barbara Bartling, recording secretary; Elizabeth Eckstein, program director; Edgar Sherman (1251 Eudora St., Denver 20, Colorado), corresponding secretary and affiliate representative.

SOCIETY MEETING

The Cactus and Succulent Society of America Inc. will visit The Huntington Botanical Garden on May 21st. All members and affiliates are invited to join in this pilgrimage. Garden opens at 1 p.m.

DON B. SKINNER
Chairman of Special Events

DESERT FLOWERS UNDER GLASS

The story of my experiences and delight in growing and flowering Cacti and Succulents in a small glasshouse in Christchurch, New Zealand

By MARJORIE E. SHIELDS

Chapter 20
NOTOCACTUS

Here they are, and as you see, Notocacti have a very different appearance from plants in the last group, even though they too, are from South America. These are very spiny and hairy plants with depressed centres and the buds announce their arrival by pushing up little tufts of grey or brown wool in a circle round the crown. As they develop, so too, do the hairs and spines with which they are clothed. The flowers are mostly in shades of yellow but we will find a few other colours as well, and they remain in flower for four days, sometimes longer. Nor are they all content to be globose plants for many are cylindrical. They seem to be in two groups, hairy ones with small flowers, with their crowns full of hairs and requiring half shade, and the spiny ones with bare crowns and large flowers, most of which revel in bright sunshine.

The hariest one is undoubtedly N. haselbergii. This is a grafted plant and is an immense cluster of many heads, so many in fact, I doubt whether the stock will be able to accommodate them all much longer. Two pieces have already been taken off, one has been grafted, the other is growing on its own roots. This is growing well, but the grafted one is like a large pale cream powder puff. But there are some very fine needle-like spines amongst the hair, and underneath many fine ribs, while the areoles seen through the mist of hair look like hail stone muslin. Both this plant and the original have masses of bright red flowers with so many petals they appear double, and look most attractive amongst the cream hair. var. stellatum is similar, only the hair is deeper cream; it makes the other look almost white. With the sun on them the golden spines glisten wonderfully. The plant is small yet but it looks to have wonderful possibilities. These come from southern Brazil.

So too, does N. leninghausii. But whereas N. haselbergii is a globular plant. N. leninghausii is cylindrical. In its natural habitat it reaches a height of up to 40 inches! Yellowish green in colour, its body is supported by many fine ribs, along the edges of which are the closely spaced areoles. Short radial hairs and fine long hair-like spines, all pointing downwards clothe the plant from top to bottom in gold. The crown as well is thickly covered with yellow hairs and masses of white wool. The yellow flowers adorning the top of the column are large and beautiful. The petals, square cut across the top, are toothed and frilled, the outer ones greenish, the inner, bright yellow. Numerous pale yellow stamens incurve round the style, the many lobed stigma rising above them. A lovely blossom lasting several days.

Another from southern Brazil is N. graessneri. A squat plant with pale yellow glassy radials and golden centrals thickened into fine spines. The many ribs are close together, as also are the areoles. This plant looks very golden indeed. Although only small it has flowered! Most intriguing tiny lime-green blossoms, with clear petals like plastic, almost inconspicuous amongst the gold. These flowers are just half an inch across and such a contrast to the rest of the group. There are plenty of others to supply the large flowers, we would not have them all alike.

At last a flower on N. schumanniana! I have had this plant for years and it has always disappointed me. But it has been well worth waiting for. The lemon yellow flower is not as large as some and when wide open the petals recurve against the yellow spines with which the plant is covered. Nothing very unusual about that. But look at the arrangement of the stamens and stigma lobes! Isn't that beautiful? Attached to the base of the petals a single row of hair-like stamens turns inwards over the top of the remaining stamens which graduate down the narrow throat. Coming up through the centre of them is the style which breaks into 16 stigma lobes. These in turn recurve over the top of the incurving stamens, the whole arrangement making a delicate and intricate pattern, like a platinum filigree brooch, for the entire centre is the colour of a silver moon. Now look at the plant itself. It has sharp ribbing but not quite as fine as the others and the areoles are spaced a little further apart. The golden spines a shade paler than N. graessneri's are finer, but there are not quite as many of them. The crown is very white and a little white wool appears in the upper areoles. but the lower ones appear red, for the bases of the hair-like spines are red. Altogether a most desirable plant.

N. scopa, "Like a broom or brush."! How very true, but what a beautiful brush! The dark blue green body is entirely hidden under a cloud of snow-white hair and wool. Pushing through the white, the long red centrals show up wonder-

fully. The canary yellow blossoms, only 1½ inches across have that clear plastic look. Yellow stamens surround the deep wine-red style and stigma lobes. A really lovely plant. Here is another almost as beautiful which I think may be N. scopa, var. ruberrima. This plant has kept us wondering as to its identity for a number of years and now the buttercup yellow flowers, followed by the seedpods have proved it to be a Notocactus. Looking more cream than white, the grass-green body can be seen through the fine hair-like spines, as the ribbing shows up more definitely. These spines are cinnamon-red, some white tipped. The crown is filled with cream wool, through which the buds appear. A golden glow in the throat of the flower reflects on to the base of the filaments; these gather round the bright cerise stigma lobes, the style being completely hidden. The flower is larger than N. scopa's which has a little more yellow in it and as we have already seen the stigma lobes are wine-red on a long red style. Both are beautiful plants and growing quite tall.

So far all the plants we have seen have had their crowns filled with hair and/or fine spines. Now we will see those with neither spines nor hair; in fact they are quite bald headed. The first is N. ottonis from southern Brazil. (So far no meanings of names have been given, as they have all been called after different people.) It is a large plant, well on its way to becoming cylindrical, with wider ribs than others here and with fairly widely spaced areoles filled with white wool. Clusters of long fine reddish brown bristle-like spines, add a distinctive touch of colour. The large, bright, glossy yellow flowers are very full petalled. These petals are narrowish and toothed and a loose bunch of yellow stamens coming from the red throat surround the red stigma lobes. The tube and ovary are covered with cinnamon wool and after the flower falls the ovary increases in size and finally splits to scatter its dry seed into the soil in the pot. This applies to all Notocacti, but the hairy ones in the first group have much smaller ovaries as well as the smaller flowers.

N. ottonis var. tenuispina, meaning "slender spined", is somewhat similar, but the long bristle-like spines much longer than on the species, are mixed cinnamon, brown, and cream as well as all the shades in between. Also it freely clusters. The blossom is canary yellow with the stigma lobes deep red. A gay flower on a good plant.

Here is N. apricus "basking in the sun", also in my glasshouse! It has a blue-green body with narrow flattened ribs, depressed at each areole. Fine unruly bristle-like radials, light red to cream in colour, adorn each areole, while long wavy centrals give this plant an unbrushed or untamed appearance. The flowers are large and beautiful with their long, narrow, sharply pointed, yellow petals, tipped and edged with red and with brilliant red filaments in the throat. The rest of the filaments are yellow, very long and loosely arranged. The long style, also red in the throat, shades to yellow and is topped with red stigma lobes to match.

N. microsperma is something like it, only the unruly centrals are bright cinnamon. Nor are the flowers such a clear yellow, a touch of bronzy red on the back petals dulling it a little; the stigma lobes are also in this same bronzy red. When the flowers fade and the seeds ripen, then we will know why this plant is call microsperma, for the seeds are very small.

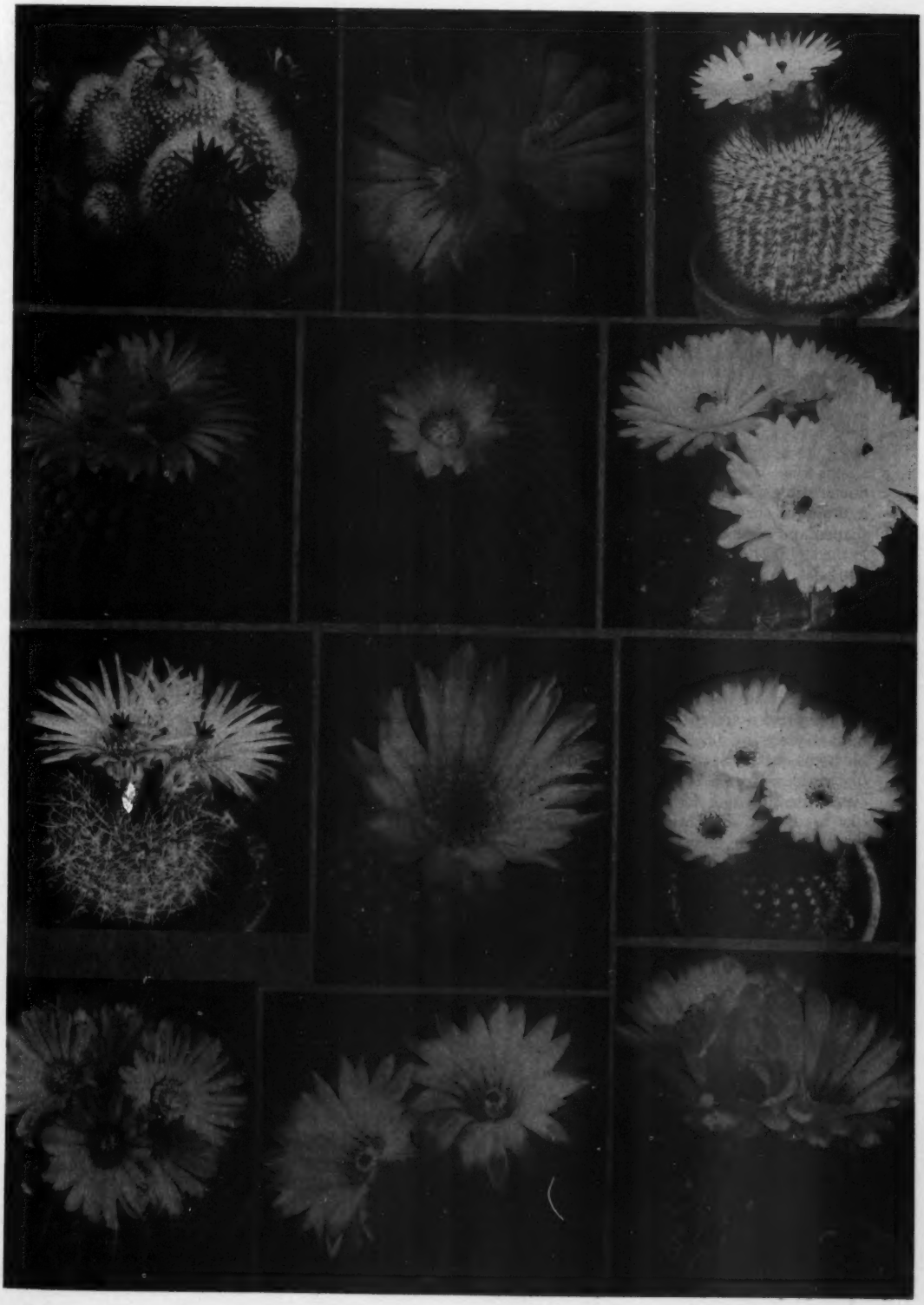
N. floricomus "crowned with flowers" comes from Uruguay and is another charming Notocactus worthy of its name, for the blossoms are four inches across, with long, narrow, toothed, lemon petals. The throat and some of the filaments have a glow of red, the rest being a deeper yellow than the petals, while the stigma lobes are deep pink. The plant itself is blue-green with white radials and bright brown centrals a little stiffer and standing straighter. Not too much sun for this one.

Here is N. tabularis but I can see no difference at all between this one and N. floricomus. Perhaps when it flowers the blossoms may be different. Then there is N. concinnus "neat and elegant"—an apt description. For it is a neat, tidy plant with fine hair-like radials and long, slender, dark brown centrals. It comes from southern Brazil and Uruguay and enjoys full sun. The canary yellow flowers are very showy with numerous petals. The red throat is full of stamens of all lengths which gather round the red stigma lobes. Have you noticed how very much like little red daisies are these Notocactus stigma lobes? Each one just slightly different in colour.

Yes, that is a Notocactus too! Isn't it a grand plant? It is N. rubriflorus, so of course it has ruby flowers; so numerous as to hide the large plant almost completely. The blossoms are not as large as some, but does that matter? They are many petalled and such a glorious colour. The orange stamens and style holding its pink daisy (stigma lobes) add to the beauty. The plant itself is large, bright green with sharper and

Fig. 19

Left to right. Top row: *Notocactus haselbergii, N. leninghausii, N. scopa.* Second row: *N. schumanniana, N. ottonis, N. scopa* var. *ruberrima.* Third row: *N. apricus, N. floricomus, N. concinnus.* Bottom row: *N. rubriflorus, N. rutilans, N. mammulosus.*



deeper ribs than most, the depressed areoles giving the edges of the ribs a tubercled appearance. Ten to twelve fine bristle radials and fine centrals about half an inch in length—usually four, but variable—fill the white woolly areoles, red at the base shading to cream. Some areoles have large tufts of wool, while the crown—when there are no flowers to hide it—looks as though it is filled with snow. A really handsome plant with wonderful blossoms.

Not to be out done by the glory of N. rubriflorus, N. rutilans tried to be ruby too. But it is neither ruby nor yellow, although it has a yellow centre and the colour shades from it, through cream to pink, with a deeper pink mid-rib showing only at the tips. It is a beautiful, almost indescribable colour. The buds, just opening, are deep rose-pink. The stamens cluster round the style like a thick ruffle, with very deep maroon stigma lobes only just showing above them. This flower as we shall soon see is rather like N. mammulosus in shape, in that the blossom is cup-shaped and clear of stamens which tightly cling to the style. The plant has very fine radial spines lying flat, trying to look like stars, while the pink tinted, stiff centrals, one to each areole, point downwards.

Now let us look at N. mammulosus with its dark green body covered with small tubercles and growing so well it is becoming cylindrical. The short cream radials and heavier centrals filling the areoles are red at the base. The flower tube is short and holds the large canary yellow blossoms, which open very wide and is shaped like a deep saucer. The yellow stamens tightly clasp the style and like N. rutilans, they look like a ruffle at the base of the purple stigma lobes. This is the oldest and largest plant in the group and the flowers are magnificent. The top of the plant is covered with them.

The last one is N. pampeanus and like N. mammulosus comes from Uruguay and Argentina. It has the heaviest ribs and the strongest spines of them all. The spines are cream, red at the base and stand away from the plant. There is nothing hairy nor bristly about either the centrals or the radials, all of which are stiff. The plant is growing tall. The majority of the areoles are bare of wool but others have thick tufts. The yellow flowers shade to orange in the throat with orange stamens and ruby red stigma lobes.

All the first ones we saw with the fine hairs and bristles and with their crowns well covered, require partial shade, unless otherwise stated, while the majority of the others prefer full sun. With these two points remembered, Notocacti present no difficulties. Mealies do not seem to care for them; they seem quite trouble free and are easy to grow and if kept dry during the winter months and given plenty of water in summer they will respond with a wealth of bright and gay flowers that last well.

Fig. 20

FROM NEW JERSEY

The Echinopsis shown here may be of interest since it is the heaviest of three flowering periods in one season. There were more than 13 flowers and since they did not all open at once, there were flowers for a week. This plant is 12 years old and has flowered regularly but not quite so generously, for five years. Offsets from the clone have flowered in four years. Previously the plant had been over-wintered at the coolest, sunniest window we have, but having acquired a small greenhouse this past winter I was able to keep it under the bench of a glass-to-ground lean-to at 45 degrees F. night temperature. The only water supplied from November to the start of the new growth, about the end of March, was the splash from overhead spray on neighboring pots.

This is just a common species but it does illustrate how delightful and easy this genus is—especially for beginners. Last summer we enjoyed at regular intervals, the orange flowers of Johnson's Echinopsis x Lobivia cross. We also easily germinated some seeds from Mr. Johnson's crosses, using ordinary procedures.

HAROLD LEVENSON
Jockey Hollow Road
Morristown, N. J.

CORRECTION

The address of the Oregon Cactus Society is 3837 NE 19th Ave., Portland, Oregon. This Society sent in a report written in longhand but due to the fire we have not been able to transcribe it for the printer. All copy for the Journal must be typewritten. Thank you.

EDITOR'S NOTE

Copy for the Journal should be typed in order to have it published promptly. Your cooperation will be a great help to your Editor.—S.E.H.

SUSTAINING MEMBERSHIPS

Orange County Cactus & Succulent Society, Santa Ana, California

Fig. 21
View along the "camino real", north of Cerro Pelon, at approximately 9000 feet. The dwarf, shrubby vegetation is mainly Ericaceous. Right: *Epiphyllum ackermannii* flower near San Isidro, along the Oaxaca-Tuxtepec highway.

Epiphyllum ackermannii in Mexico

Observations and Notes on its Occurrence in Oax.

On January 11, 1959, my Zapotec friend 'Chico' and I left Oaxaca by bus—destination "Cerro Pelón." I planned to take advantage of new road construction, and extended bus service, to revisit the Sierra Juárez.

Cerro Pelón is just out of Zapotec territory and the passengers disembarking there were Chinantecs, mostly from the nearby towns of Comaltepec and Yolox—"nearby", but some 2000 feet below.

From the 10,000 ft. pass at Cerro Pelón, we started out, down thru the cloud forest, on an extremely interesting walk that was to take us, on the third day, to the nearly sea level town of Valle Nacional.

During parts of the first two days we were seeing many plants of an Epiphyllum that had the earmarks of *E. ackermannii*. Later, we were able to check the altitudinal range of the species, and found it to be, approximately, between 6000 and 8000 feet. Below this altitude we observed two other Epiphyllums, the first looked like typical *E. oxypetalum*, the second in the "strictum" group. However the former may well be debatable *E. caudatum*, its type locality here—in Comaltepec territory.

Early May, 1959 found us back in the same area—this time to trap a collection of small mammals. I had timed the trip to coincide, if possible, with the flowering of *Epiphyllum ackermannii;* however it was pure luck that we arrived during the height of bloom. Masses of the large, brilliant red flowers were all around us.

Because of our trapping activities, and other collectings, the Epiphyllums were somewhat neglected, and, when we finally prepared to photograph flowers, clouds were already rolling up for the afternoon mist or rain. Pictures were taken under a clouded sun.

The flowers were open almost flat—between salverform and very widely funnelform—to a diameter of from 6 to 7 inches.

Since our last visit, bus service had progressed, along with road construction, and now there was a daily run over the entire route, from Oaxaca to Tuxtepec. After picture taking, we had barely gotten our belongings together when the Oaxaca bound bus came along.

It was interesting to observe the reaction of fellow passengers, in this instance "gente de razón" (sophisticated people), to the floral display. Ordinarily they would pay little attention to the wayside vegetation. When I was able to identify the flower as a "pitahaya," my prestige jumped.

One may wonder, to consider *Epiphyllum ackermannii*, so abundant, and so, comparatively near the city of Oaxaca, yet apparently never introduced to cultivation there. Many collectors, including the writer, have travelled over the old "camino real" trail between Oaxaca and Tuxtepec, with no record of the species. Perhaps

centuries of natives, gathering flowers for altar adornment, have eliminated it along the trail? The new highway does not, in this area, follow the course of the old trail, but was opened thru areas of previously unmolested, virgin cloud forest.

Probably the first good habitat record of *E. ackermannii* was made by Charles Gilly—see Cactus and Succulent Journal XVI, No. 7, July, 1944.

During a previous period of years, when my travels to the Isthmus were via Vera Cruz, I would visit the famous "Jardin Lecuona," near Jalapa. *E. ackermannii* was grown there, from plants "brought in by the Indians." I feel sure that Dr. Helia Bravo and other Mexican cactologists must be familiar with habitats in Vera Cruz and (or) Pue.

E. ackermannii may not thrive where summers are hot and dry. The late Dr. Juan Iwersen grew the cool climate Epiphyllanae and Heliocerei to perfection in Mexico City. At 7000 ft. altitude San Cristobal Las Casas, Chis., in the "Casa Balom" of Frans and Gertrude Blom, these species also thrive, but the collections there are still small, and some unidentified species lack habitat data.

Epiphyllum ackermannii may well have been introduced to cultivation in Europe during the past century (or even before that) and used in hybridizing, but if so, records are obscure.

Maybe if selection were made from a large number of "Orchid Cacti" seedlings, for several generations, some of the species involved could be identified?

T. MacDougall
Oaxaca, Oax.

TO THE LIARS CLUB:

My hobby is cactus and on my collection trips, I have many encounters with rattle snakes. I refer to this little anecdote as the 'Whistling Rattler'. It happened in Duval County, Texas where they grow so large that if you choose to challenge one you must joust with him according to the rules of the game. I was hunting specimens when I flushed a family of quail which scattered to all points. After a little time I heard a quail whistle the "let's get back together" call and immediately a "here I am" answer close in front of me. I looked and looked for the quail who had answered the first one, but could not see it to save me. But I did finally see a big rattler and darned if he wasn't whistling that first quail right on up to him. I froze statue still to watch this, to me, unusual action. The poor little thing came confidently on the run and too late he saw his error or perhaps he was blinded by visions of great wealth (it was a diamond back) and in a shade under a flash he was seized and headed down the hatch.

Now the smart boys who write books assure you that snakes are deaf, but they say nothing about their being dumb, and I read somewhere that "The wisdom of the serpent confoundeth the wise." Also his eyesight is perfect. Not being possessed of an overly brilliant mind it took me a little while to figure out just what happened, but I finally got it. The rattler saw the sound waves go by, recognized them for what they were, gave the correct reply and now you know how they grow so large.

Homer A. Jones
Alpine, Texas

Notes on Haworthias

J. R. Brown

Haworthia musculina G. G. Smith in Journ. So. Afr. Bot. XIV (1948) 49, fig. 3 & Pl. VIII.

Plant with leafy stems to 20 cm. long and about 6 cm. diam., erect, later decumbent, proliferous from the base and forming clusters, light green becoming bronzy-green in the sun.

Leaves multifarious, ascending, incurved, coriaceous, about 4 cm. long, to 2 cm. broad towards base, ovate-lanceolate, acuminate, acute, terminating in a reddish-brown cusp; face of leaf flat-convex, smooth, with a raised concolorous lengthwise middle line and one on each side arising from the margins about the middle of the leaf and meeting the middle line at different points near the tip, pale green becoming darker in the sun; back of leaf rounded, with 12-16 transverse rows of raised white, round to mostly transversely oblong tubercles, some confluent transversely, the rows at middle of leaf about 2.5 mm. apart; keel central or more or less oblique.

Locality: Cape Province; Bathurst, Distr., about 15 miles N.W. of Port Alfred.

This Haworthia of the sect. *Coarctatae* differs from *Haw. reinwardtii* by the more transversely arranged tubercles, broader leaves, less striking tubercles, brownish color and more robust habit.

The illustration of this Haworthia is of a division of a plant from G. G. Smith. Occasionally a few greenish-white tubercles are to be found on the leaf faces. In cultivation the terminal cusp is green in the younger plants later becoming reddish-brown and often withering in strong light. The tubercles also seem to become narrower in cultivation and often form continuous very narrow transverse bands. It is a robust grower, from which the name *musculina* was probably given, and should be given a situation in good light as it seems to lose its character if grown in too much shade.

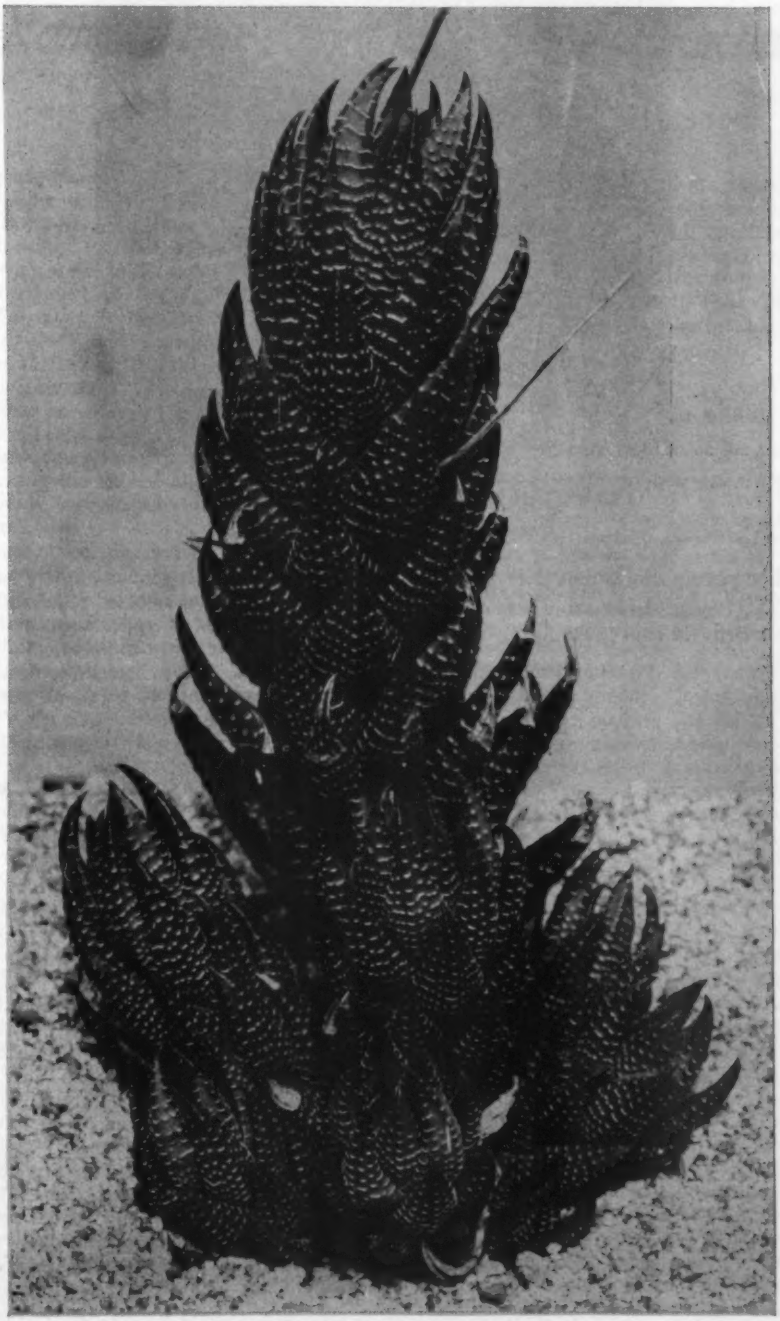


Fig. 22
Photo: *Haworthia musculina* G. G. Smith nat. size

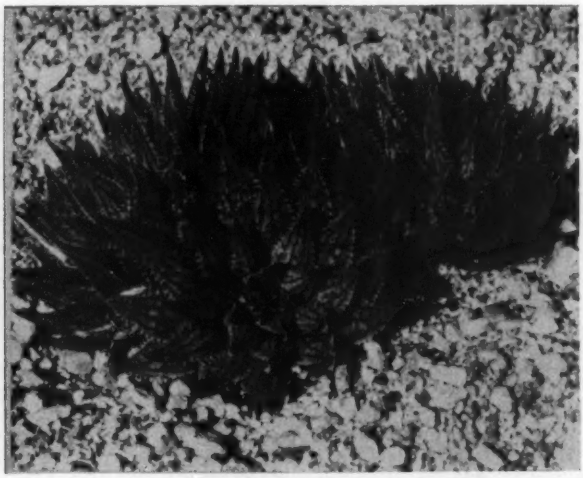


Fig. 23
Photo: *Haworthia marumiana* Uitewaal nat. size

Haworthia marumiana Uitewaal in Cact. en Vetpl. VI (1940) 33, fig., in Cact. & Succ. Journ. Gt. Brit. IX (1947) 20, fig.

Plant a many leaved rosette, stemless, more or less glaucous green, becoming somewhat reddish in the sun, 2-4 cm. in diam., proliferous from the base and ultimately forming dense clusters.

Leaves multifarious, younger erect the older spreading and incurving, obovate to somewhat oblong-lanceolate, sometimes more or less abrupt-spreading and incurving, obovate to somewhat oblong-lanceolate, sometimes more or less abruptly acuminate, 12-20 mm. long and 5-8 mm. broad and terminating in a minutely ciliated bristle about 2 mm. long; face of leaf flat to lightly convex with 2-4 (usually 3) darker anastomosing lines in the upper half which often reach the tip and between the lines relatively large irregularly rounded or oblong pellucid spots arranged lengthwise and which often form pellucid tubercles tipped with a minute pellucid tooth; back of leaf keeled or sometimes doubly keeled in the upper half, with 3-6 darker lines and with similar but smaller pellucid markings which are seldom toothed; margins and keels with pellucid flexuous teeth 0.5-1 mm. long, the teeth on margins often confluent at the base thus forming a continuous pellucid margin.

Peduncle simple, slender, 25 cm. or more tall including raceme, scarcely 1 mm. in diam. with numerous sterile bracts, many towards base; pedicels 2-3 mm. long, bright green, bracts about 5 mm. long; perianth about 15 mm. long, tube obclavate, subtrigonous, lightly curved, about 4 mm. diam. near base, white with pale reddish-brown lines, 3 upper segments somewhat erect, 3 lower very recurved, mid upper segment broader, 2 lower lateral segments with involute margins, lines on segments green becoming yellowish-green.

Locality: Cape Province; Ladismith (Ladysmith in error) and Mossel Bay.

Named in honor of Dr. Martinus van Marum of Holland who was very interested in and a collector of South African succulent plants in the early days and who corresponded with Salm-Dyck and Haworth regarding them.

The illustration of *Haw. marumiana* is of a plant kindly sent to me by A. J. A. Uitewaal many years ago. I have also received this plant from So. Africa collected in the vicinity of Mossel Bay. It is distinct from other small Haworthias of the sect. *Arachnoideae* by the relatively large pellucid spots on the face of the somewhat broader leaves than such other small plants as *Haw. tenera, Haw. translucens,* etc., and the somewhat darker color of the leaves. It is most trractive in small clusters of 5-7 rosettes, otherwise when the plant becomes overcrowded a mass of insignificant small rosettes results.

Some confusion occasionally occurs between Ladysmith and Ladismith. While both towns seem to have been named after the same person, Lady Smith, the wife of a former governor of the Cape Colony, Ladysmith is far to the north in Natal but Ladismith is in Cape Province, in an area associated closely with succulent plants.

A Revision and Amplification of Pediocactus I

By LYMAN BENSON

Department of Botany, Pomona College,
Claremont, California

The genus *Pediocactus* was proposed by Britton and Rose in 1913 to encompass a single species, *Echinocactus simpsonii* Engelm., which occurred within the range covered by Britton and Brown's book entitled, *An Illustrated Flora of the Northern United States, Canada, and the British Possessions from Newfoundland to the Parallel of the Southern Boundary of Virginia, and from the Atlantic Ocean Westward to the 102d Meridian*. Ed. 2. The territory in eastern North America covered by the Flora included few cacti, and the globular to ovoid one on the Great Plains was given a name of Greek derivation denoting the habitat on a plain. Actually this species is more characteristic of mountainous areas farther west.

The publications on cacti by the writer have not covered this species, and the status of the genus proposed by Britton and Rose has not been discussed. In relationships this and several other species of small cacti occurring on the Colorado Plateau lie between *Echinocactus* and *Mammillaria* interpreted in the broad sense employed by the writer. As stated publicly on various occasions during the past twenty years, the generic limits of the Cactaceae are much in need of study, and doubtless some divisions of *Echinocactus* and *Mammillaria* need to be made. However, how many divisions are to be made and just how they are to be made is in most instances an unsolved problem.

Pediocactus is the oldest generic name applied to any element within a small group of related species, which seem to warrant organization as a genus composed of three or perhaps four sections. The generic limits and organization will be discussed in a later paper of this series. In this paper, the species belonging to the typical section, *Pediocactus*, are described and keyed.

Citation of specimens. Studies have been in both the field and the herbarium, and these are continuing. The herbaria are cited according to the standard symbols, cf. J. Lanjouw and F. A. Stafleu, *Index Herbariorum*, ed. 4, part 1 *(Regnum Vegetabile 15)*. 1959. These are as follows:

Des Desert Botanical Garden of Arizona, Tempe
DS Dudley Herbarium, Stanford University, California
Mo Missouri Botanical Garden, St. Louis
Pom Pomona College, Claremont, California
NY New York Botanical Garden, New York City
US United States National Herbarium, Smithsonian Institution, Washington, D.C.
WS Washington State University, Pullman
WTU University of Washington, Seattle

This paper is prepared with the financial assistance of several grants-in-aid for research from the Claremont Graduate School, one from the Society of Sigma Xi for 1950, and two from the National Science Foundation, covering the periods 1956 to 1959 and 1959 to 1962. The aid in all phases of the work is acknowledged with gratitude.

PEDIOCACTUS Britton & Rose

Synonomy to follow under each of the sections.

Stems solitary or sometimes clustered, rarely more than 2-5, ½ to 3 or 6 inches (1.2-7.5 or 15 cm.) long, ⅜ to 3 or 6 inches (0.9-7.5 or 15 cm. in diameter, green or glaucous, cylindroidal to globose or depressed-globose; ribs none; tubercles more or less pyramidal, conical, cylindroidal, mammillate, or trunate-conical, prominent, not coalescent; leaves none; areoles 1/24-¼ inch (1-6 mm.) in diameter, typically 1/24 to ¼ or ½ inch (1-6 or 12 mm.) apart; spines more or less obscuring the surface of the joint, exceedingly variable in color, number per areole, direction, texture, and flattening, the longer ones 1/24 or ¼ to ½ or 1¼ inches (1 or 6-12 or 3.1 cm.) long, 1/240 or 1/72 to 1/24 inch (0.1 or 0.3-1 mm.) in diameter or breadth basally, acicular or in one species subulate, circular or narrowly elliptic in cross section; flower 2/5 to 1 inch (1-2.5 cm.) in diameter, 2/5 to 1 or 1½ inches (1-2.5 or 3.8 cm.) long; sepaloid perianth parts with the midribs pink, green, brown, or maroon and the margins white, pink, or yellow, the largest ones obovate, oblong, spathulate, obovate-oblanceolate, or obovate-oblong, mostly ¼ to ¾ inches (6 to 18 mm.) long, 1/24 or ⅛ to ⅜ inches (1 or 3-9 mm.) broad, obtuse, rounded, or truncate, fimbriate, denticulate, or entire but undulate; petaloid perianth parts white or with pink or yellow on at least the midribs, the largest ones oblanceolate, obovate-oblanceolate, or narrowly oblong-cuneate, ⅙ or ½ to ¾ or 1 inches (4 or 12-18 or 25 mm.) long, 1/16 or 3/16 to ¼ inches (1.5 or 4.5-6 mm.) broad, acute to rounded, entire or mucronate or shallowly indented, marginally entire or minutely denticulate; anthers yellow or perhaps sometimes white, 1/36-1/20 inches (0.75-1.25 mm.) long; style more or less green or yellow, ¼ to ¾ inches (0.6-1.9 cm.) long, 1/48 to 1/16 inch (0.5-1.5 mm.) in greatest diameter; stigmas 5-8 or perhaps more, 1/36 to 1/16 inch (0.75-1.5 mm.) long; fruit green, often changing toward tan or yellow, dry at maturity, naked or with a few scale-leaves, otherwise smooth except for the veins, more or less obovoid or subglobose or cylindroidal but tending to be enlarged upward and narrow basally, ⅙ to ⅜ inches (4-15 mm.) long, 3/16 to 5/16 inches 4.5-7.5 mm.) in greatest diameter, with the umbilicus shallow, circumscissile on the broad apical margin and dehiscent, as well, along a dorsal slit produced by another abscission layer; seeds black or gray, papillate-tessellate, irregularly or obliquely obovoid or broadly so and somewhat flattened, 1/16 to 3/16 inch (1.5-4.5 mm.) long, 1/24 to ⅛ inch (1-3 mm.) broad, 1/36 to 1/16 inch (0.6-1.5 mm.) thick; hilum obovate or elliptic, appearing to be on the edge of the seed.

Section I. PEDIOCACTUS

Pediocactus, as genus, Britton & Rose in Britton & Brown, Ill. Fl. No. St. & Can. ed. 2. 569. 1913.

Utahia, as genus, Britton & Rose, Cactaceae, 3: 215. 1922.

Pilocanthus, as genus, B. W. Benson & Backeberg, Kakt. und and. Sukk. 8: 187. 1957.

Stems globular, depressed-globular, obovoid, or short-cylindroidal, little longer than their diameter or rarely twice as long. Spines usually cylindoidal, acicular, circular to elliptic in cross section, glabrous or puberulent, the surfaces smooth, often more or less polished, rarely finely canescent.

KEY TO SPECIES

1. Sepaloid perianth parts and the few (if any) scales attached to the floral tube covering the ovary either minutely toothed or short-fimbriate or entire and undulate; perianth funnelform, the petaloid parts pink-and-white, with no yellow; areoles not more than 1/8 inch (3 mm.) in diameter; larger spines slender, not more than 1/32 inch (0.7 mm.) in diameter; seed black, 1.5-2 mm. long.
   2. Central spines either (rarely) none or (when commonly present, except in juvenile plants) rigid, gradually curving or sometimes straight, in mature plants wholly or at least distally reddish-brown or reddish, 5/16 to 1/2 or 1 1/16 inches (7.5-1.2 or 2.8 cm.) long, 1/72 or 1/48 to 1/32 inch (0.3 or usually 0.5-0.7 mm.) in diameter; petaloid perianth parts marginally white with pink midribs or middles.
      3. Central spines present, except in juvenile plants, or in the lower areoles persisting in adult plants, 5-8 or 11 or in younger plants as few as 3 per areole; radial spines glabrous or sometimes sparsely canescent in juvenile plants, nearly straight, spreading irregularly from the circular areole, 1/4 to 3/8 or 3/4 inch (6-9 or 19 mm.) long; stems 1 to 5 or 6 inches (2.5-12.5 or 15 cm.) long, 1 to 4 or 5 inches (2.5-10 or 12.5 cm.) in diameter, standing well above the ground level; flower 1/2 to 1 or 1 1/2 inches (1.2-2.5 or 3.8 cm.) in diameter; fruit 1/4 to 3/8 inch (6-9 mm.) long, with a few scales on the surface, these and the smaller lower scales of the perianth tube short-fimbriate; seed about 1/12 inch 2 mm.) long
         1. *Pediocactus simpsonii*
      3. Central spines none; radial spines finely canescent, gradually recurving, spreading pectinately from the elongate areole, 1/24 to 1/18 inch (1-1.4 mm.) long; stems up to 1 1/2 inches (3.8 cm.) high and about 3/4 inch (1.9 cm.) in diameter, protruding barely above ground level, exceedingly inconspicuous; flowers about 2/5 inch (1 cm.) in diameter; fruit about 1/6 inch (4 cm.) long, without scales; scales of the perianth tube entire but undulate; seed about 1/16 inch (1.5 mm.) long.....2. *Pediocactus knowltonii*
   2. Central spines flexible and hairlike, bending and curving irregularly or straight, uniformly colored, white or ashy gray, turning to straw- or cream-color in age, 1 to 1 5/16 inches (25-32.5 mm.) long, about 1/96 to 1/72 inch (0.2-0.3 mm.) in diameter; smaller lower scales of the perianth tube undulate and minutely and irregularly denticulate, the uppermost portion of the ovary usually without scales (these, if present, minute and located at the extreme summit); petaloid perianth parts white with pink midribs.....3. *Pediocactus paradinei*
1. Sepaloid perianth parts and the scales of the ovary all long-fimbriate; perianth rotate, the petaloid parts yellow with maroon veins; areoles about 1/4 inch (6 mm.) in diameter; larger spines rather stout, 1/32 to 1/24 inch (0.7-1 mm.) in diameter; seed gray, 4.5 mm. long...4. *Pediocactus sileri*

1. PEDIOCACTUS SIMPSONII (Engelm.) Britton & Rose

Stems solitary or sometimes clustered and then the clumps up to 1 foot (3 dm.) in diameter; larger stems or branches globular to depressed-ovoid or sometimes elongate-ovoid, 1 to 5 or 6 inches (0.25-1.25 or 1.5 dm.) long, 1 to 4 or 5 inches (0.25-1 or 1.25 dm.) in diameter; tubercles more or less pyramidal, mostly 1/4 to 3/8 inch (6-9 mm.) long, about 3/16 to 5/16 inch (4.5-7.5 mm.) broad basally; areoles up to 1/8 inch (3 mm.) in diameter; spines numerous, often obscuring the stem, central spines reddish-brown or sometimes red or pale yellow to cream on the basal halves, 5-8 or 11 (in young plants none or as few as 3) per areole, spreading widely or sometimes nearly erect, curving gradually or sometimes straight, the longer ones 3/8 to 1/2 or 1 1/16 inches (0.9-12 or 2.8 cm.) long, 1/72 or 1/48 to 1/32 inch (0.3 or 0.5-0.7 mm.) in diameter basally, acicular, elliptic to circular in cross section, radial spines whitish to cream or sometimes pale reddish brown, 15-30 per areole, spreading at right angles to the tubercle, nearly straight, 1/4 to 3/8 or 3/4 inch (0.6-0.9 or 1.9 cm.) long, slender; flower 3/4 to 1 or 2 inches (1.9-2.5 or 5 cm.) in diameter, 1/2 to 1 or 1 1/2 inches (1.2-2.5 or 3.8 cm.) long; sepaloid perianth parts with the midribs greenish and the margins pink, the largest ones narrowly oblanceolate-oblong, 3/8 to 1/2 or 1 inch (0.9-1.2 or 2.5 cm.) long, 1/8 to 3/8 inches (0.3-0.9 cm.) broad, rounded, each with about 1/48 inch (0.5 mm.) of the margin petaloid and (in the smaller perianth parts) shallowly fimbriate; petaloid perianth parts pink to nearly white or sometimes magenta, the largest ones narrowly oblong-cuneate, 1/2 to 3/4 or 1 inch (1.2-1.9 or 2.5 cm.) long, 3/16 to 1/4 or 3/8 inches (4.5-6 or 9 mm.) broad, apically irregularly shallowly indented; filaments yellow, 1/4 or sometimes 3/8 inches (6 or 9 mm.) long; anthers yellow, 1/36 inch (0.7 mm.) long; style greenish, 1/2 or sometimes 3/4 inch (1.2 or 1.9 cm.) long, usually 1/24 inch (1 mm.) in greatest diameter; stigmas 5 or perhaps more, 1/36 inch (0.7 mm.) long, acute; ovary in anthesis with a few fimbriate scales on the upper portion; fruit greenish, tinged with red, dry at maturity, smooth, with a few scales on the upper portion, fundamentally short-cylindroidal but bulging irregularly and widened upward, 1/4 to 3/8 inches (6-9 mm.) long, 3/16 to 5/16 inches (4.5-7.5 mm.) in diameter, with the umbilicus depressed and having a thin border; seeds gray or nearly black, tessellate-tuberculate, obovoid or obliquely so in outline but the oblique hilum forming a long straight line along one side, up to more than 3/32 inch (2 mm.) long, about 1/16 inch (1.5 mm.) broad, less than 1/16 inch (1.2-1.3 mm.) thick; hilum obovate, 1/24 inch (1 mm.) long, with a sharply raised border.

TABLE 1. CHARACTERS OF THE VARIETIES OF PEDIOCACTUS SIMPSONII

	A Var. *simpsonii*	B Var. *minor*	C Var. *robustior*
Stem branching & shape	Usually unbranched, globular to broadly ovoid	Unbranched or rarely branching, globular	Usually branching, usually elongate
Stem length	2 to 5 or 6 inches (0.5-1.25 or 1.5 dm.)	1 to 2 or 3 inches (0.25-0.5 or 0.75 dm.)	2 to 4 or 5 inches 0.5-1 or 1.25 dm.)
Stem diameter	3 to 4 or 5 inches (0.75-1 or 1.25 dm.)	1 to 2 inches (0.25-0.5 dm.)	2 to 2½ or 3 inches (0.5-0.62 or 0.75 dm.)
Spine habit	Spreading widely	Spreading widely	Suberect
Central spines			
Color	Reddish-brown (or red) or pale and yellowish or cream on the lower half	Dark reddish-brown	Dark reddish-brown
Number	5-8 or 11	5-8	6-11
Length	⅜ to ½ or ¾ inch (9-12 or 19 mm.)	5/16 to 7/16 or 9/16 inch (7.5-10.5 or 13.5 mm.)	⅝ to 1-1/16 inches (15-26.5 mm.)
Diameter	1/72 inch (0.3 mm.)	1/72 inch (0.3 mm.)	1/36 inch (0.7 mm.)
Radial spines			
Color	Whitish or cream	Whitish or cream	Pale reddish-brown
Number	15-30	20-28	12-25
Length	¼ to ⅜ inch (6-9 mm.)	¼ inch (6 mm.)	½ to ¾ inch (12-19 mm.)
Thickness	Slender	Slender	Stout
Flower diameter	¾ to 1 inch (1.9-2.5 cm.)	½ to ¾ inch (1.2-1.9 cm.)	1¼ to 2 inches (3.1-5 cm.)
Sepaloid perianth parts	Narrowly oblanceolate-oblong, sometimes narrowly obovate		Obovate to spathulate-obovate or nearly lanceolate
Geographical distribution	Southern Idaho and Montana to central Nevada, northern Arizona, New Mexico, and western Kansas.	High mountains of central Colorado; perhaps also including forms occurring in southern Utah and northern New Mexico	Disjunct in occurrence; eastern Washington; eastern Oregon; westernmost Idaho; northeastern Nevada

A. Var. simpsonii. *Cf. Table 1*

Sandy or gravelly soils of valleys, flats, and hillsides in dry areas at mostly 6,000 to 9,500 feet (1,800-2,850 m.) elevation. Juniper-Pinyon Woodland and Sagebrush Desert and the lower open portions of the Rocky Mountain Montane Forest. Southern Idaho and Montana to central Nevada, northern Arizona (Grand Canyon), northern New Mexico and western Kansas.

SYNONOMY AND TYPES

Echinocactus simpsonii Engelm. Trans. St. Louis Acad. Sci. 2: 197. 1863. *Mammillaria simpsonii* M. E. Jones, Zoe 3: 302. 1893. *Pediocactus simpsonii* Britt. & Rose in Britt. & Brown, Illustr. Fl. ed. 2. 2: 570. 1913. "Butte Valley, in the Utah desert, and Kobe Valley, farther west . . ." Cf. J. H. Simpson, Rept. Expl. Gt. Basin Terr. Utah. Engineering Dept., U.S. Army 74-75. 1876. Kobe, Kobeh, or Kobah Valley is in Nevada between the present towns of Eureka and Austin. The camp of the expedition on May 25, 1859, was at Lat. 39° 20′ 13″ N; Long. 116° 39′ 12″ W. The specimen from Kobe Valley, *Henry Engelmann*, May 24, 1859, is designated as a lectotype. The Butte Valley collection, *Henry Engelmann*, May 15, 1859, *Mo.*, approaches somewhat the var. *robustior*. Lectotype, *Mo.*

Mammillaria purpusii K. Schum. Monatss. Kakteenk. 4: 165. 1894. C. A. Purpus ". . . sammelte im Jahre 1893 in der Umgebung der Städte Delta und La Mesa, welche in einer Höhe von 2900 m über dem Meeresspiegel liegen und zum Staate Colorado in den Vereinigten Staaten gehören. In dieser erhabenen Alpenlandschaft . . . findet sich eine grosse Anzahl Kakteen . . ." The size of the plant indicates var. *minor*, but the color of the central spines var. *simpsonii*.

Pediocactus hermannii W. T. Marshall, Saguaroland Bull. 8: 78. 5 *photos*. 1954. "Type locality:—Garfield County, Utah, at 6,200 feet." "The type specimen has been deposited in the Douglas Herbarium of the Desert Botanical Garden [Tempe, Arizona]. Isotype will be sent to the Herbarium of Brigham Young University at Provo, Utah." "The species was first found by Mr. and Mrs. A. Hermann and their son August, Jr., of Phoenix, Arizona in August 1953 . . ." Type *Des.* Perhaps referrable to var. *minor*.

B. Var. minor Engelm. *Cf. Table 1*

Rocky soils of high valleys and mountain sides in grasslands and at the edges of forests near timberline at 8,800 to about 10,000 feet elevation. Plains Grassland in dry areas of the Rocky Mountain System. Colorado from 40° N. Lat. to the vicinity of Pikes Peak. Var. *minor* is in need of further field study to determine its limits of occurrence and its degree of distinction from var. *simpsonii*. Small plants from southern Utah, southern Colorado, and northern New Mexico may or may not be referrable to this variety.

SYNONOMY AND TYPES

Var. *minor* Engelm. Trans. St. Louis Acad. Sci. 2: 197. 1863. ". . . In Colorado Territory, e.g., in coarse gravel or in crevices of rocks, abundant near Mount Vernon, at the base of the mountains (Parry, Hall, & Harbour). Flowers in May; fruit in July and August." The following collection is designated as a lectotype:

Mt. Vernon, presumably by *Parry, Hall, and Harbour, Mo.*

SPECIMENS EXAMINED

COLORADO: LATITUDE 40° (the latitude of Boulder). *E. Hall* in 1862 (syntype), Mo. CLEAR CREEK CO. Moraine soil above Empire, *Englemann,* Aug. 27 and Sept. 1, 1874, Mo, Pom. Valley near Empire, *Patterson 211,* July 29, 1892, Mo, Pom, NY. CHAFFEE CO. Buena Vista, Biltmore Herbarium, July 2, 1896, NY. PARK CO. Near Hartsel, *L. & R. Benson 15694,* Pom. TELLER CO. Pikes Peak, *collector unknown,* in 1860, Mo, in 1861, Mo. COUNTY UNKNOWN. Mt. Vernon, *Parry, Hall, and Harbour* in 1862, Mo; "Spring", *Martindale* in 1878, Mo.

C. Var. **robustior** Coulter. *Cf. Table 1*

Gravelly soils of hillsides in the desert at mostly 1,500 to 3,000 or (southward) 5,000 or reportedly 10,000 feet (450-900 or 1,500 or 3,000m.) elevation. Sagebrush Desert. Disjunct in occurrence in eastern Washington (between Ellensburg and the Columbia River and in Grant County), eastern Oregon (Wheeler County), Idaho (Snake River Canyon near its confluence with the Salmon River), and Nevada (Humboldt and Havallah mountains).

Occurrence of this variety in Washington was noted first by Geyer, London Jour. Bot. 5: 25. 1846, and later by Piper, Fl. Wash., Contr. U. S. Nat. Herb. 11: 397. 1906.

SYNONOMY AND TYPES

Var. *robustior* Coulter, Proc. Amer. Acad. 3: 377. 1896. "Type, Watson of 1868 in Herb. Mo. Bot. Gard. From the Humboldt Mountains of Nevada . . ." The following specimen is designated as a lectotype: Type, "Mountains of Nevada, 8-10,000′ alt. from Rum River eastward to the East Humboldt Mountains. No. IV. Sereno Watson, of King's Party. 40° lat." Lectotype, Mo.

Pediocactus simpsonii (Engelm.) Britt. & Rose var. *nigrispina* W. T. Marshall *nom. nud.* in Marshall & Bock, Cactaceae 140. 1941. (Without Latin diagnosis.) "Priests Rapids, Washington. Material for observation supplied by A. S. Harmer of Dieringer, Washington."

SPECIMENS EXAMINED

WASHINGTON: KITTITAS CO. East of Ellensburg, *F. G. Meyer 1426a,* Mo; Hill between Ellensburg and Vantage, *L. Benson 1324,* Pom, DS; near Vantage, *J. W. Thompson 11506,* WTS, Mo, NY, Pom; Rimrock near Vantage, *J. W. Thompson 8215,* WTS, Mo, NY; Ginkgo Petrified Forest Park, bluffs along the Columbia River, *H. W. Smith 399,* WS. YAKIMA CO. Yakima, *E. Nelson,* May 28, 1902, NY; Sentinel Bluffs, Saddle Mountains, near Priest Rapids, *Cotton,* July 14 1903, WS, *M. A. McColl,* Oct. 1920, NY. GRANT CO. north of Ephrata, Iron Springs, *St. John 4119,* WS; Quincy, *J. Packard 591,* WS.

OREGON: WHEELER CO. northwest of Mitchell, *Cronquist 6908,* WS, NY.

IDAHO: IDAHO CO. Convergence of the Salmon and Snake rivers, *Jacqueline Packard 590,* May 5, 1939, WS *107729, F. G. Meyer 1598,* Mo. NEZ PERCE. Near Zasa, *J. H. Christ 14201,* June 12, 1944, NY.

NEVADA: ELKO (?) CO. "Mountains of Nevada, 8-10,000′ alt., from the Rum River eastward to the Humboldt Mountains." "40° Lat." *S. Watson No. IV* in 1868, Mo; Havallah Mts., 8,000 ft., *S. Watson* in June, 1868, NY.

2. PEDIOCACTUS KNOWLTONII

L. Benson. KNOWLTON CACTUS

Very small plants with the stems solitary or a few in a cluster; stem up to 1½ inches (3.8 cm.) high and about ¾ inch (1.9 cm.) in diameter; barely protruding above ground level, remarkably inconspicuous; tubercles cylindroidal, conical, or pyramidal, 1/16 to 1/10 inch (1.5-2.5 mm.) long, 1/16 to 1/12 inch (1.5-2 mm.) in diameter; areoles about 1/24 inch (1 mm.) in greatest diameter, typically 1/24 to ⅛ inch (1-3 mm.) apart; spines dense but not obscuring the tubercles, white or sometimes turning reddish-tan or pink or tipped with pink, finely canescent with white hairs, mostly 18-23 per areole, all radial, spreading pectinately from the elongate areole and moderately recurving, the longer ones 1/24 to 1/18 inch (1-1.4 mm.) long, or a little longer, 1/240 inch (0.1 mm.) broad basally, subulate, tapering gradually to the apices, flattened, elliptic in cross section; flower (as reconstructed by boiling a withered one) about 2/5 inch (1 cm.) long; sepaloid perianth parts pink with white margins, the largest ones oblong, up to ¼ inch (3 mm.) long, up to slightly more than 1/24 inch (1 mm.) broad, truncate-rounded, entire but undulate; petaloid perianth parts pink, the largest ones oblanceolate, about ⅙ to ⅕ inch (4-5 mm.) long, up to 1/16 inch (1.5 mm.) broad, acute to rounded, entire; filaments about ½ inch (1.2 cm.) long; anthers about 1/36 inch (0.6-0.7 mm.) long; style about ⅓ inch (8 mm.) long, 1/16 inch (1.5 mm.) in greatest diameter; stigmas about 7 or 8, about 1/24 inch (0.5 mm.) long; fruit green to tannish, dry at maturity, without scales, obovoid-turbinate, about ⅙ inch (4 mm.) long, about ⅛ inch (3 mm.) in diameter; seeds black, irregularly obovoid, 1/16 inch (1.5 mm.) long, 1/24 to 1/20 inch (1-1.2 mm.) broad, 1/36 inch (0.6 to 0.7 mm.) thick.

Gravelly soils of hills in dry areas at about 6,000 feet (1,800 m.) elevation. Juniper-Pinyon Woodland, Colorado and New Mexico near Los Piños River.

SYNONOMY AND TYPES

Pediocactus knowltonii L. Benson, Cact. & Succ. Jour. 32: 193. 1960. "Type specimen: Los Piños River near La Boca, Colorado, on the Colorado-New Mexico line, *Fred. G. Knowlton,* late May, 1958. *Herbarium of Pomona College No. 288,314.* Publication validated here by request; full publication and a revision of *Pediocactus* to follow in the March number of the Journal."

This cactus was sent to the writer in the spring of 1958 by the late Mr. Fred G. Knowlton of Bayfield, Colorado. Although it appeared to represent a new species, there was uncertainty of the maturity of the plants. In his notes Mr. Knowlton indicated that the plants had come up in disturbed soil, as follows: " . . . There were acres of coarse gravel that 'dozer has ramped around in. Found a few dead plants but 'dozer has cut everything down and little white spined balls were coming up all over the place . . . Am sending a couple—Didn't know there were any Pedio within miles." The plants were of uncertain age, and there was no assurance that all had come from the disturbed area. They were in fruit, though this may have followed flowering in a juvenile stage of development. A letter to Mr. Knowlton did not bring the required infor-

mation but news of a tragedy, for a friend answering said that Mr. Knowlton had died in a fire which consumed his home in June, 1958. The species is dedicated to his memory and to his untiring efforts in study of the plants and especially the cacti of the region.

Although the distinctive spines differed from those of juvenile plants of *Pediocactus simpsonii* vars. *simpsonii* and *minor*, publication of the new species was considered to be unwise until evidence of maturity of Knowlton's plants could be obtained. Field study in southern Utah in June, 1960 (south side of the La Sal Mountains, *L. & R. Benson 16054*, Pom), confirmed the differences in the type of spine occurring in the smaller forms of *Pediocactus simpsonii*. In August, 1960, Mr. Prince Pierce and a group of others from Albuquerque, New Mexico, visited the general area in which Mr. Knowlton found the small *Pediocactus* and collected specimens. Where Mr. Pierce found the plants, "The ground . . . was not disturbed at all . . . " This was an area of " . . . untouched wilderness." The largest of these plants, therefore undoubtedly mature, were of the same size as those collected by Mr. Knowlton. The specimens have been planted in the hope of obtaining flowers before adding the plants to the Herbarium of Pomona College. A colored photographic transparency of a flower has been sent by Mr. Ed Nadolny of Albuquerque through the courtesy of Mr. Pierce. The flower structure in the illustration was obtained by boiling the dried remains attached to a fruit of the type collection.

3. PEDIOCACTUS PARADINEI

B. W. Benson. HOUSEROCK CACTUS

Depressed plants, the stems solitary, 1-2 inches (2.5-5 cm.) high, 1-2 or reportedly 3¼ inches (2.5-5 or 8 cm.) in diameter; tubercles truncate-conical, about ⅛ inch (3 mm.) in diameter, up to 3/16 inch (4.5 mm.) high; areoles ⅛ inch (3 mm.) in diameter, typically ⅛ inch (3 mm.) apart; central spines hair-like, usually dense but sparse in some young individuals, white to pale gray, becoming straw or cream color in age, the apical portions sometimes darker, 4-6 per areole, the centrals and the approximately 20 radials not clearly distinguished, all spines flexible, straight or curving irregularly, the longer ones mostly 1 to 1 5/16 inches (2.5-3.25 cm.) long, about 1/96 to 1/72 inch (0.2-0.3 mm.) in diameter basally, acicular, elliptic to nearly circular in cross section; flower ¾ to 1 inch (1.9-2.5 cm.) in diameter, up to ⅞ inches (2.2 cm.) long; sepaloid perianth parts reddish-green, the margins white, the largest ones obovate, up to ½ inch (1.2 cm.) long, up to ¼ inch (0.6 cm.) broad, rounded or blunt, undulate and minutely irregularly denticulate; petaloid perianth parts white with pink midribs, the largest ones oblanceolate-obovate, up to ¾ inch (1.9 cm.) long, up to ¼ inch (0.6 cm.) broad, rounded and mucronulate, minutely denticulate; filaments yellowish, up to ¼ inch (6 mm.) long; anthers yellow, oblong, 1/32 inch (0.6-0.7 mm.) long; style greenish, nearly ½ inch (10-12 cm.) long, 1/16 inch (1.5 mm.) in greatest diameter; stigmas 5-6 (?), 1/16 inch (1.5 mm.) long, broad; ovary in anthesis ⅛ inch (3 mm.) long, smooth; fruit greenish-yellow or becoming tan, dry at maturity, smooth except for the veins and sometimes minute subapical scales, nearly cylindroidal but enlarged upward, 5/16 to 7/16 inch (7.5-10.5 mm.) long, 3/16 to ¼ inch (4.5-6 mm.) in diameter; seeds nearly black, tessellate-tuberculate, obliquely obovoid, 3/32 inch (about 2 mm.) long, 1/16 inch (1.5 mm.) broad, 1/24 inch (1 mm.) thick; hilum elliptic.

Relatively rich gravelly soils of alluvial fans and flats in the desert or grassland at 5,000 to 6,000 feet (1,500-1,800 m.) elevation. Sagebrush Desert and Great Plains Grassland. Northern Arizona in and near Houserock Valley, Coconino County.

SYNONOMY AND TYPES

Pediocactus paradinei B. W. Benson, Cactus & Succ. Jour. 29: 136 *f. 83-84* 1957. Cf. also W. T. Marshall, Saguaroland Bull. 10: 89-91, 107. *4 figs.* 1956. *Pilocanthus paradinei* B. W. Benson & Backeberg, Kakt. und and. Sukk. 8: 187-189. 1957. *"Type collection:* Holotype deposited in the Boyce Thompson Southwestern Arboretum Herbarium. No. Bwb 8-1956-1. Isotype deposited in the Herbarium of Pomona College, No. 286,120."

SPECIMENS EXAMINED

ARIZONA: COCONINO CO. Houserock Valley, *Bernard W. Benson Bwb 8-1956-1, Pom 286120* (isotype); near Houserock Valley, *L., E., & R. Benson 15755*, Pom.

4. PEDIOCACTUS SILERI (Engelm.) L. Benson, comb nov. *UTAHIA*

Stems solitary, depressed-ovoid or sometimes ovoid, 2 to 4 or 5 inches (0.5-1 or 1.25 dm.) long, 2 to 3 or 4 inches (0.5-0.75 or 1 dm.) in diameter; tubercles truncate-conical, ¼ to 7/16 inch (6-10.5 mm.) in diameter, ⅜ to ½ inch (9-12 mm.) high; areoles about ¼ inch (6 mm.) in diameter, typically about ½ inch (1.2 cm.) apart; spines densely covering the stem; central spines wholly or partly brownish-black, becoming pale gray or nearly white in age, 3-7 per areole, nearly porrect, straight or slightly curving at the tips, the longer ones ¾ to 1⅛ inches (1.9-2.8 cm.) long, 1/32 to 1/24 inch (0.7-1 mm.) in diameter basally, acicular, nearly circular in cross section, each tapering gradually from base to apex; flower about 1 inch (2.5 cm.) in diameter, about ⅞ inch (2.2 cm.) long; sepaloid perianth parts with the midribs maroon and the margins yellowish, the largest ones obovate-oblanceolate, up to ⅜ inch (1.5 cm.) long, about ⅛ to 3/16 inch (3-4.5 mm.) broad, rounded, marginally scarious and long fimbriate; petaloid perianth parts yellowish or straw color with maroon veins, the largest ones obovate-oblanceolate, ⅜ to ¾ inch (1.5-1.9 cm.) long, 3/16 to ¼ inch (4.5-6 mm.) broad, apically rounded, minutely denticulate; filaments yellowish, ¼ inch (3 mm.) long; anthers yellow, 1/20 inch (1.2 mm.) long; style yellowish, ¼ inch (6 mm.) long, 1/24 inch (1 mm.) in greatest diameter; stigmas probably 5 or 6, 3/32 inch (about 2 mm.) long; ovary in anthesis with a few fimbriate scales; fruit greenish-yellow, dry at maturity, with several long-fimbriate scales above, nearly cylindroidal, but enlarged upward, ½ to ⅝ inch (1.2-1.5 cm.) long, ¼ to ⅜ inch (0.6-0.9 cm.) in diameter; seeds gray, finely tessellate-tuberculate, obliquely obovate, 3/16 inch (1.5 mm.) thick; hilum incurved as seen in side view.

Hills in the desert at 4,700 to 5,000 feet (1,400-1,500 m.) elevation. Transition areas between Sagebrush Desert and Mojavean Desert. Northern Arizona in the vicinity of Pipe Spring.

SYNONYMY AND TYPES

Echinocactus sileri Engelm. ex Coulter, Contr. U. S. Nat. Herb. 3: 376. 1896. *Utahia sileri* Britt. & Rose, Cactaceae 3: 215. 1922. "Type [A. L.] Siler of [May] 1883 [*Mo* . . .]" "Cottonwood Springs and Pipe Springs, southern Utah [Arizona]." Type, *Mo* (2 sheets); photograph, *NY*.

SPECIMENS EXAMINED

ARIZONA: COCONINO CO. Pipe Spring, *Peebles and Parker* in 1940, Ariz, Pom (photograph of seeds), *L. Benson 13530*, Pom; east of Pipe Spring, *L. & R. Benson 15207*, Pom, *15757* Pom; west of Fredonia, *E. R. Blakeley*, June 5, 1953, Des, *E. R. Blakeley & W. H. Earle*, June 22, 1951, Des.

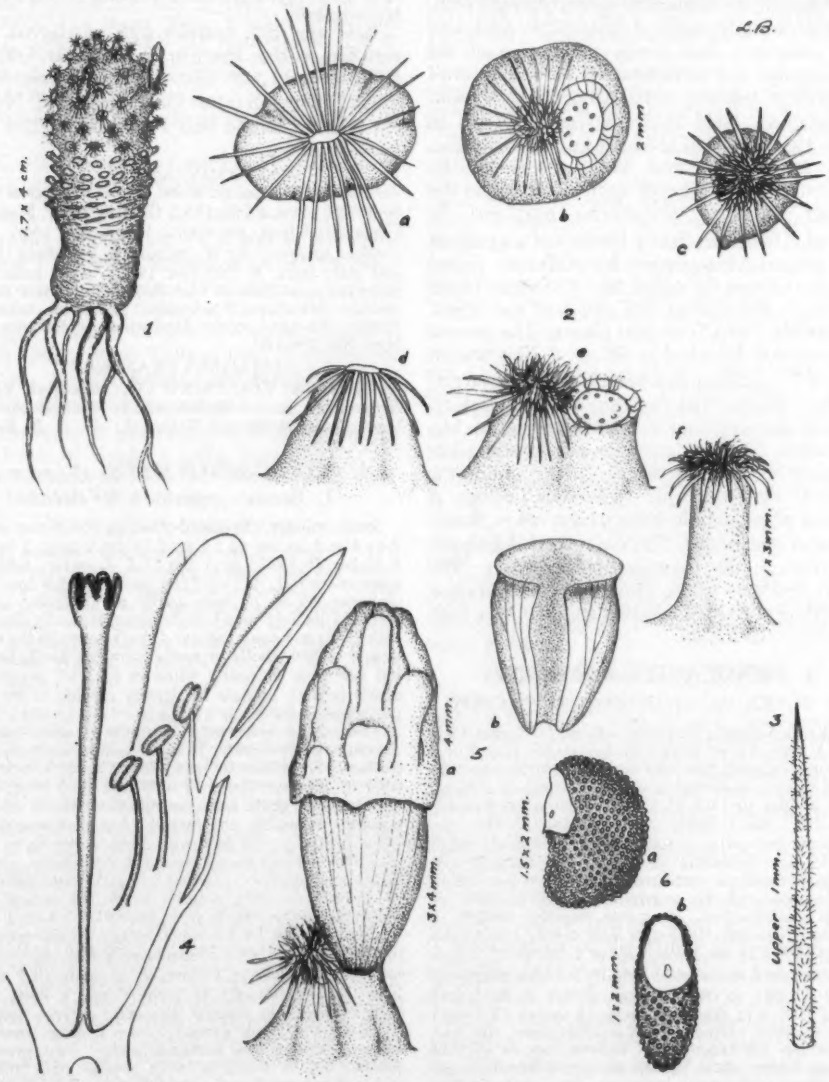


Fig. 24

Fig. 24. *Pediocactus knowltonii*, drawn from the type specimen collected near La Boca, Colorado. *1*, a single plant with fruits; *2*, tubercles, *a-c*, from above, *d-f*, from the side, *c*, *f*, young tubercles, *a*, *d*, old tubercles, *b*, *e*, tubercles after falling of the fruit, leaving the flower- and fruit-producing area exposed; *3*, tip of a spine enlarged, showing the canescence (fine hairiness); *4*, portion of a longitudinal section of a flower, prepared by boiling the dried remains of a flower attached to a fruit (as in *5a*); *5*, fruits, *a*, young fruit attached to the tubercle ventral to the spine-bearing area and bearing the dried remains of the upper portion of the flower, *b*, old fruit after dehiscence along abscission layers formed in a circle at the apex (the fruit therefore circumscissile) and longitudinal on the dorsal (back) side; 6, seeds, *a*, in lateral (side) view, *b*, in ventral view (toward the axis).

Here it is winter, almost spring, and I'm vegetating from the summer and fall rush of storing plants in their regular places to which they respond. New places are sought after reading, etc., for non-responding plants —a new project which will keep me busy. Of course I'm always studying the why and wherefores of sulking plants.

The winter dryness of last winter plus coolness, did produce more flowers on repeaters and new entries in the flowering records. I got 33 percent more of these which will be repeats in 1961. The Epiphytes and Orchid cacti responded with several new ones flowering but failed with some old favorites. I do not advocate extreme dryness any more than I do wetness. I shall use a weekly watering of my Epiphytes especially those that sulked. Epiphyllum ackermannii responds to coolness and infrequent waterings which usually follows for those Orchid Cacti having the red-edge on new growth. Too much dryness affects the E. deutches kaiserin types and its hybrids with its dry spots and damaged roots. Rhipsalis and close relatives are usually left slightly dry from October to mid-November; then when the buds begin to appear I resume watering.

A few years ago I read a report regarding the control of nematodes by adding humus to soils which builds up concentrations of beneficial fungi and organic matter in the soil. I've a great believer in the use of organic matter as was an early experimenter, Eugene Ziegler. I have many of his plants in the original soil and they are still free from nematodes.

I have had good results with leafmold, decayed wood, etc. I have potted up my most likely nematode types in the heavily organic soil. In examining the roots of Echinopsis, cloumnar cacti, and Selenicereus, I have found that the roots are healthier and do not dry back and become powdery, white fungi and colonies of blue mold which resembles the molds found on non-treated bulbs of dahlia, etc. In repotting, when I find nematodes, I seldom cut back the roots to healty tissue. Of course I do sterilize old, used soils before re-using or let them become rejuvenated in the open sun, wind, rain and freezing temperatures.

Of course a healthy plant fights most of its own battles against disease and parasites. I store humus-rich soils of sand, trace elements, and loam, to age each fall for use in case of accidents, new arrivals, and repots.

As in other plants, deficiencies are noticeable and the same can be easily seen in succulents. Some of these can be corrected with leafmold, coal and wood ashes, and fertilizers—as Vigero, etc. The lack of Boron causes dwarfing, poor branching, death of terminal buds, leaves at the top of plants become thick and brittle and tend to roll in half circles from the tip. I have seen this in Pereskiopsis, Pereskias, Opuntias, etc. Since Borax used in the kitchens contains Boron, I've used it on my suspicious cases and it works. Borax improves the color and texture of spines which cactologists say are modified leaves.

So far, fluorine has not been of any trouble to me and I believe it will be of no concern in the future. Some of my correspondents believe it is detrimental and has caused losses. I have been using our city water since it has been fluorinated and I usually answer that the amount found in the water is much less than that in the waters of the Southwest, even after the pot soil build-up in our own greenhouses.

I've been looking over the cactus dealers' catalogs and field reports. The variety and interest certainly banishes the winter let-down and bolsters that spring pick-up. Some dealers ask a month to six weeks to fill an order so why not order some new and exotic types now to satisfy our acquisitive natures? Have you ordered a new book lately? A good cactophile reads. I hope to meet you in Mexico City for our bi-ennial convention in July. Get those shots early and join us.

JOHN E. C. RODGERS

SPOTLIGHT ON ROUND ROBINS

New members are fewer this time. Perhaps it is due to Christmas having enough activity without writing to join round robins. Nevertheless, I am happy to welcome Mr. David B. Grigsby, San Gabriel, California; Mr. Robert D. Wagner, Milwaukee, Wisconsin; Mr. Lloyd I. Showers, Mesa, Arizona.

Robin needs are about the same since the last report though I have a couple more to add to the list. The Small Cacti and Mimicry Succulents Robin needs several members. I am using the original name for this but if you grow succulents of any kind you may join the group because other succulents are being allowed. Almost all members, however, do have some of the mimicry plants to talk about. Members from abroad are welcome to join as well as those in this country. There is a request for another Epiphyllum Robin and with two members on the waiting list I would like to have three more to get the second Epi Robin on its way. Anyone interested? Just to recall the other Robins which have been mentioned and are waiting for members, there are: Mammillaria Robin No. 2 and also another International Mammillaria Robin (No. 2) with several members waiting, the Cerei Robin, and several Cactus and Succulents Robins (No. 2 and No. 4), as well as individual places in special Robins such as for Euphorbias or general Cactus and Succulent Robins. If any of these are of interest why not drop me a line about joining a Robin of your choice and getting some personal pleasure out of your membership in our Cactus and Succulent Society by corresponding with other members through these Robins.

I have an item or two from several Robins and a report on Window Sill Robin No. 1 which will make interesting reading I hope. From C. & S. Robin No. 5 Alayne Appel, on her summer vacation to Sanibel Island off the west coast of Florida, remarked in her letter "You probably know New Jersey people don't have much to collect (in New Jersey), so imagine my delight when on Sanibel I found several varieties of Opuntia growing on the flats, which I think was probably covered with water at some time or other. I didn't take any Opuntias home with me but I did find many small agaves, 12″-18″ high, two of which I packed in plastic bags filled with their natural gritty soil. They arrived home in perfect condition". She stopped at the garden of the Sarasota Succulent Society on the way home and said of the garden, "This is the first time I've ever seen cacti growing outdoors all year and I was amazed at the perfection of most of the specimens. In addition to all this, epiphytic cacti were virtually whorling around the trees, some in bud and bloom."

In the Epiphyllum Robin, Irving Reimann wrote on November 30th, "At the time of this writing I have eight blooms open my my Epi "Poinsettia" with three blooms finished and about a half dozen more large buds will open within the next couple of weeks. Three other Epi's have buds which should open in a month or less— "Nayada" has many in all stages of development, "H. S. Irwin" has five and "Mauvette" has one. All bloomed last spring. I especially like Epi's which bloom more

than once a year, or which have a long blooming period like Neyada. Padre is supposed to be one of the most reliable bloomers, yet it is a very shy bloomer for me. It is nine feet long. It bloomed once in '58 and not at all in '59 and '60." These epi's are all grown in a greenhouse in Michigan. Another member of this Robin, Evelyn Garrett in Oregon, wrote "When I repotted my "Seabreeze" it didn't do too much for a while, and then almost overnight it began putting on an amazing amount of growth. I had put it in one of those tall tomato juice cans, punched holes at the base for good drainage and hung the can up on the back porch wall. It has five new limbs already. Most of my Epi's are in gallon cans or even larger."

The Cactus and Succulent Window Sill Robin No. 1 has as its Director Miss Agnes T. Hirschinger of New York City. Its members include Mrs. Ruby Elrod, Georgia; Mrs. Elodie Gardner, Pennsylvania; Mr. Ian McKay, British Columbia, Canada; Mr. Bryant Plitt, Virginia; Mrs. Wanda Kihlstrom, Utah. I'll begin with the newest member, Wanda, who began her letter, "Dear Members: What fun I have had reading all your informative and nice letters. I started collecting cacti and succulents in the fall of 1959, so my collection is not very old, although I purchased some mature plants last March. A Cereus peruvianus crest, a Ferocactus latispinus and an Opuntia mammilata crest, all of which apparently are doing all right. The other day, as I stooped down to pick up a piece of paper from the kitchen floor, I noticed a very (pardon the expression) ROTTEN smell. I thought, "Oh! I must empty that trash can, something has spoiled!" Straightening up, my eye fell on the blossom of Stapelia variegata. What a beautiful but strange-looking flower! After reading that it has its horrible odor to attract flies for the purpose of pollination I can overlook its bad smell.

Ruby Elrod, who has just moved to an island off the Georgia coast, wrote, "Dear Friends: Some of my plants took to the climate just fine and grew more than they had before. Stapelia, Haworthia, Gasteria, Christ Thorn, most all succulents are doing fine. Some cacti are doing just as well but some haven't shown signs of anything. Century plant (Agave) is planted along with Yucca (Spanish Bayonet) in parks and yards. It grows and thrives anywhere and is real pretty. Everyone is amazed at my cactus and when I have some in bloom everyone comes to see the flower no matter how small it is. When my Stapelia gigantea blooms, as it has five or six times, the porch is full of people looking at them."

Elodie Gardner, whose letter was dated October 30th, wrote, "Dear Friends: I have two Mams blooming that I got last year. One, Mam. rhodantha, has rose-pink blooms and is a very lovely shaped plant too—five inches in height, the other, Mam. sempervivi, has white or ivory blooms. While some descriptions call for white or pink flowers, the plant looks like all the pictures I have of it." She also wanted to know what would make a Paramount Hybrid bloom.

Ian McKay offered a suggestion to her in his letter which he began, "Dear Robin Friends: I would like to welcome the new member to our group. It is nice to have one more "western" member to keep me company! Elodie: To bloom your Paramount, try additional applications of phosphate or fertilizers high in phosphate (the middle figure of the analysis). This works well with Echinopsis. I, too, like my Mamm. rhodantha with its dark red flowers and find it to be a steady and profuse bloomer. Mine, 3″x3″, bloomed most of the summer. You, Bryant, myself and I think Agnes, all have this one in our collections, so it is quite popular. Ruby: Your Turk's Cap (Melocactus) should do well for you in its new location, since your climate sounds much like their native habitat. Most authorities indicate that Melocactus is difficult to grow and warn amateurs away from the species. I got my first one this past summer to try my luck with it."

Agnes Hirshinger wrote on November 24th, "Dear Friends: All plants are bedded down for the winter, although I have "dunked" them twice since the end of October, once with Malathion, to put the mealies to sleep too if there were any, and again just last week for a few moments when it seemed they were shriveling a bit and far too soon. It is most difficult to gauge treatment under these altered conditions. My aim is to keep them from growing, if I possibly can, and still not have them wither from the warmth. I am cutting the illumination down this winter, compared to last, with this end in view. The same amount of light, but not the same duration. Lights go on at 6:00 a.m. and off at 9:00 p.m. Last year, their first in a warmer room, they insisted in growing though slowly all winter and this I think was the reason, in part at least, for the lack of flowers in the spring and summer. I can certainly endorse the Paramount Hybrids. My big Orange produced about six flowers this year with only a quarter of the sun it had been used to, although these came along individually and not in the flushes as formerly. It was still willing to go on when summer was over. It now consists of a tall "centerpiece" and a whole flock of smaller offsets. These have pushed the parent plant over so it is at an angle. It is NOT "pretty" but apparently as tough as they come, and cooperative. A smaller "Red" has many offsets too but does not grow nearly as fast, nor is it as tubular in shape as the Orange." To Bryant she said, "The charcoal theory is news to me. I have always used charcoal (granulated horticultural grade) for its aerating qualities, but I suppose if the bone meal does release ammonia fumes, these same qualities apply there."

Bryant Plitt writing on November 7th began, "Dear Robins: The summer was a good one, only three days of 90 degree temperature and much rain. Some cacti couldn't take it (Mams) as they burst and bled to death—nothing I did could stop it. All were milky sap varieties. Others took the rain in stride and grew to real beauties. The Thanksgiving cactus is full of blooms and buds (32) from a cutting in '59. I think now that one of the secrets of the Zygos is to grow them cool when budding. Have kept them on the glass porch since coming in from the lath house. Some nights have gone down to about 45 degrees. They were given a "Plantab" when growth was noted and another when buds appeared." He continued, "Early in the summer I was on a one day picnic trip in the mountains of Maryland. I brought back several paper bags of fine black leaf mould and it has turned out to be the finest soil mixture (acid type) I've ever seen. Gosh! Things just pop out all over. Haven't the slightest idea what it is but Elodie has mentioned it in regard to her woods soil too. I'll be using it for the jungle cacti. Have enclosed a good article on charcoal. I hope to get some excerpts ready on Jap bonsai (dwarf trees), that is, the soil mixture and many of the logical ideas easily applied to such things as cacti. As a matter of fact they also use cacti as bonsai. Ruby, I believe you will have good luck now where you are with orchid cacti and other jungle types. Have you ever tried Lithops or the Stone Faces? Mine from Johnson were a year old this summer and I certainly do like them and wish I had planted more. Up in West Virginia I found small pebbles that match them almost exactly and the camouflage is amazing. A great curiosity with visitors. I mulched the pot with the pebbles up even with their flat surfaces. Pictures show it as natural to them in Africa."

This brings the round to an end. Do remember to write if you are interested in a Robin.

(Mrs.) Gladys H. Panis
P. O. Box 705,
Falmouth, Massachusetts

Our Mexican Diary

By HAZEL JOHNSON

A trip taken in behalf of the Society to arrange for the Convention

Aug. 18, 1960, Mr. and Mrs. Moorton and my husband and I left Palm Springs about 2:30 in the afternoon. The temperature high, 114°, in the car even higher with no respite from the breeze. A swim in the pool at the motel in Calexico refreshed us.

Aug. 19. We crossed the border at Mexicali, and after waiting some time in the office of Migración to get our visitor's permits, we discovered we needed our birth certificates. It was necessary first to obtain a notarized statement of birth place and the permit was soon given to us. We also took out insurance on our cars, as United States insurance in most cases is not valid in Mexico. It is very necessary to have Mexican car insurance. We proceeded along the border to San Luis. There were lush farms of cotton, then desert and occasionally low rocky hills, then Cholla and Ocotillos appeared along with Greasewood, Smoke Trees, Palo Verde and our friendly Saguaros increased in numbers as we climbed a little. Unusual to us was to note so many were single column; then of a sudden every one was branched. A relative of the Elephant Tree graced our camp. Many small Saguaros tipped with new growth of shining spines and Ocotillos fully leaved showed evidence of recent rain. A desert range surrounded us. Our satellite "Echo 1," appeared in the northern sky, discernible only by its movement as the sky was thickly studded with stars.

Aug. 20. Breakfast and camp clean-up over with, we started for Sonoyta and on the way saw Opuntias and Lophocereus schottii, Organ Pipe, Ocotillos and Saguaros. Palo Verdes were beautiful here as they had recently had much rain. The mesquite was a lovely mass of soft, pale green. Arriving at Sonoyta we filled up with gas and water and proceeded to a small Custom's station about ten to fifteen miles further where we are told we can get our car permit. On the way are flat leaved Opuntias, Echinocereus, Ferocactus wislizeni, and forests of Lemaireocereus thurberi and Lophocereus schottii. At the Customs we are informed that car permits are obtrained at Sonoyta so we return; after an hour we finally receive our papers and turista stickers are applied, we continue on our way. Lemaireocereus, Saguaros, and Opuntias are still with us when we reach Cabarca where we buy gas and ice for refrigerator and for extra water for washing and dishes as it is quite necessary we save our drinking and cooking water which we have brought from home. We decide to go on to Santa Ana; it is Saturday and everyone is gay. There is a pretty plaza with very modern electric lights. A storm is threatening and as we camp the rain begins and continues through most of the night.

Aug. 21. The day dawns clear and pleasantly balmy. Every plant about us is lush with new growth and low, yellow flowering plants abound all about our campsite. As we drive on we find a very pretty mimosa-like shrub with dainty white balls for blossoms and another flowering larger shrub with a striking pink inflorescence. A puncture weed (Tribulus) with yellow blooms, much larger than those of the escaped weed in the States is a beautiful wayside plant. Charming small morning glory plants with tiny ½" blue flowers, a very striking lantana also appears with orange flowers larger than our cultivated ones and tender, pretty foliage, serrated at the edges. Then for many miles along the road a plant with large 3" orange-yellow flowers, petals deeper color at the base, apparently tuberous rooted as it bore only two laciniate leaves. Suddenly we came across a change in the flora, we found two elephant-tree like shrubs, one had a two seeded pod, the seeds very large. Another with pinnate leaves. Then a new species of ocotillo (Fouquiera macdougalii) which differs from our ocotillo in having a short trunk. Another morning glory has soft blue flowers 1" across. We are to see many morning glories in great variety all along our trip. The scenery is becoming magnificent with high mountains of basaltic formation covered with L. thurberi and other growth.

Aug. 22. We camped last night near Guaymas at a beautiful bay, Miramar. Mountains about us were covered with Lemaireocereus thurberi. At Guaymas we purchased supplies of bacon, bread and ice from a self-help grocery store. There is a beautiful bay, Bacochibampo, with many small craft anchored there. Near noon we took a side road and had our lunch in a cactus forest. Here were beautiful specimens of Pachycereus pecten-aboriginum, 20′ in height. Magnificent Lemaireocereus thurberi often with short central trunk with many arms up to 20′ in length. Lophocereus australis with red seed pods and long flowering stems with long stiff bristles. Rathbunia kerberi formed low thickets. Pedilanthus macrocarpus with pretty red flowers and Mam. yaquiensis together with Fouquiera macdougalii and an Agave with long blue-green leaves grew here. Rounding a curve in the road there was much comotion

of police and fire engines trying to save a cottongin on fire. We found an Ibervillia, a tuberous rooted gourd, with pretty, slender blue-green leaves and tiny brilliant orange gourds. Then we saw a Palo Verde new to us and two or three opuntias; one, near Opuntia fulgida, almost spineless with heavily ribbed stems and apparently night blooming with reddish colored flowers. We looked for Wilcoxia diguettii but we failed to locate any plants as they were not in fruit. Ferocactus alamosanus was also about. Then appeared an extensive plantation of Agave from which tequila is made. Stopping for gas at Ciudad Obregon we go on to Navajoa and over a well paved road to Los Alamos. We arrived late and as we were eating our dinner the small boys and girls lingering at our back door suddenly shouted "Echo, Echo" and there it was, bright from reflected sunlight. Several of the youngsters shouted "Es Russo, Russo!" They were much surprised to find it was the satellite Echo of our United States.

Aug. 23. We visited the market and several small shops and the plaza of Los Alamos. Once a thriving city because of gold and silver mining it is now re-awakening because of tourists. Leaving this quaint town we travel for several hours and suddenly enter a forest of Lemaireocereus thurberi so thick they seem as blades of grass in a lawn. There are a few Pachycereus pecten-aboriginum among them. The beautiful pink blossoms of Rosa Montanã are very abundant here. It is a tuberous rooted vine climbing in the trees. We see, also Fero. alamosanus in bud and flower. Pedilanthus macrocarpus with pink fleshy fruits; Fouquiera macdougalii with red flowers but not as pretty as our own species. It is a much bigger plant with a short trunk from which the branches spring. The white flowered bush borage is here in full bloom. It is a lovely shrub about 5′ with large white clusters of blooms. A lovely mimosa with hundreds of beautiful pink puffs for flowers is a delight to see. There was also a small hairy shrub with pink flowers about ⅝″ dimaeter in abundance. Mam. mazatlanensis grew among the bushes and in the open. Rathbunia alamosensis was scattered about in thickets. We notice that Lophocerei are not present. At this point we leave the state of Sonora one of the largest in Mexico. Our next town is El Carrizo and as we wend our way south we see many Zopolotes del Rey or King Buzzards. We cross the Rios Fuerte and Sinaloa and arrive at Guamachil where we stay the night. All around watching us wash and prepare and eat our dinner are many children. Dogs, too. There was a pavilion, open all around with a good band playing Mexican music for our entertainment. Later Harry and Slim went over for the evening and were immediately accepted among the happy group! They served refreshments and apparently this was a stopover for truck drivers and passersby. Since there was quite a good sized band and several waitresses one wondered how the small group of patrons could support such an establishment. Everything was very orderly. Our Mexican friends love the life and vivacity and music of their meeting places.

Aug. 24. We leave Guamachil at 8 A.M., trees, grass and our trucks are covered with morning dew as though a light rain had fallen and the sky is overcast. Along the way we see a climbing Pereskiopsis in the trees with brilliant orange, proliferous fruit. Mountains are shrouded in misty clouds. Homemade wagons pass by us with rubber-tired wheels and are drawn by two or four burros. We arrive at Culiacan about 11 A.M. Just below the city we stop to walk through an almost impenetrable jungle with only small trees and very occasionally a Ficus or Bombax. On the opposite, more open side, we found an Acanthocereus and another Pereskiopsis. A tree had large, white, sympetalous flowers and was very pretty. During a heavy rainstorm we stopped at a wayside stand for coffee. The wife of the proprietor led us into the kitchen and introduced us to her children among them a pair of identical twins. She was very much interested in flowers and had many pots of flowering and foliage plants. In clearing fields they often leave a number of large specimens of Pachycereus pecten-aboriginum but we noticed the plants were very unhappy and in a few years died. These and other varieties of cacti evidently loved the shade of the low thorn forest and tips of many could be seen above the trees. We approach Mazatlan, several hotels and motels ring a beautiful bay. It is quite hot and humid so we welcome refrigerated rooms in our motel Aqua Marina. There is a lovely swimming pool but we choose the ocean for bathing and find the water pleasantly warm.

Aug. 25. We visited the market and saw many fruits and vegetables and other products of the region and after making a few purchases we fill our refrigerator with ice and then start on the road to Tepic. There are many Brahea palms along the way and then there is a graceful fan palm about 30′ high. Then, for some time, we see many beautiful trees in full bloom with long tassels of pale pink or white flowers. There are plantations of mangoes and tamarind which bears a sour-sweet pod. At the beginning of our trip into Mexico homemade telephone poles were any shape but straight but today we notice some are made of palm-tree trunks. Continuing through groves of palms we pass several pools of blue waterlilies. Harry obtained some seed. Here also, is the Calabash Tree (Crescentia cujete), the fruits of which are used for dishes.

As we approach Tepic we see many beautiful maple and dark red-barked trees, which the natives refer to as mahogany. A common small tree was a Bocconia, belonging to the poppy family, and similar to one we saw in Peru. We camped here under a huge aba tree. It rained heavily during the night and as we are at a higher altitude, about 3,000 feet, the air is cool.

Aug. 26. We start early as we plan a side trip here. Walking by the roadside is an Indian with a raincoat made of palm leaves. Huge Yucca's 20 feet tall are in full bloom, trunks about 3 feet in diameter. They are a beautiful picture. Scattered pine trees appear and soon an open forest of them. We stopped near a small stream and discovered numerous varieties of ferns, Achimenes, a Pancratium, Philodendron, a wild Poinsettia, and Dahlias. Everything is lush and dripping moisture from last night's rain. Passing through a coffee plantation we see a beautiful red-bracted bromeliad on a tree and two very pretty bamboos, one with strict stems and the other with a pretty branching, lacy effect. A road runner scurries across our path. There are so many banana and corn fields, some high on the steep mountain slopes, that soon there will be no jungle left. On the way back to Tepic we find more Achimenes and a big orange flowered Tigridia with flowers 5 inches in diameter. There are many wayside stands in Tepic some offering soft drinks and others fruits. From some house a phonograph plays raucously. Out of town we pass many pools filled with water hyacinths and soon are among the banyan trees. There are many cows, horses and burros on the road. They often siesta in the middle of the highway. In the pines again. We lunch in a meadow rich with flowers of many varieties, a pretty many-stemmed red flowered Bouvardia of which we have seen many different species. They were familiar because many years ago they were common green-house plants. Hundreds of small flowered plants 1-2 inches high of vivid colors make a pretty Persian carpet, of the meadow. A rich purple morning glory with magenta center, dots the stream bank while above them hang lovely purple Achimenes and pink begonias in full bloom among the ferns. There was Mila biflora which is very widespread, a liliaceous plant it has small corms and 1 or 2 large, snow-white blossoms with extremely long tubes. Agave stricta is almost past blooming. Precious, tiny flowered water hyacinths a different species than we had found before abound in one of the pools. Later we came to a huge lava bed. Here we see large, quite lovely specimens of Cephalocereus leucocephalus, some Hylocerei, another Pereskiopsis and, new to us, a species of begonia of the Martianus group. This group bears tall spikes of pink blossoms with many tiny corms in the leaf axils. Here, again are many ferns. Pat's quick eye finds a Ceph. leucocephalus crest which Slim adds to their collection. As we go along Pachycereus pecten-aboriginum still keeps us company. Many tree Opuntias appear and the mountains about us are beautiful with a solid coverage of green shrubs and trees. We arrive early in the evening in Guadalajara and stay at modern Motel Malibu. This is the second largest city of Mexico, having a population of almost 378,000 and is at 5,220 feet altitude.

To be continued

RAPID GROWTH OF NEWLY FORMED SACRAMENTO GROUP

The idea of forming a cactus and succulent society in Sacramento, California, was not a new one. It had been in the minds of many interested persons for a long while.

More than two years ago, the idea of organizing such a group in this area was mentioned, and at that time, it seemed an excellent thought. However, on checking into the matter of programs, we learned that speakers were not available. And so, without further thought, nothing more was done about forming a group. Nevertheless, since that time, the idea persisted in the minds of many, and like *topsy,* the demand for a cactus and succulent society *just grew.* By January of 1960, we felt the time had come *to do something about it.*

The lack of speakers presented a problem. How could we organize a group, and most important, how could we keep it going without guest speakers? Out of necessity, we had to consider some other type of meeting to insure its survival. The suggestion was made that the group operate as a "study class" with membership participation.

A preliminary meeting was held on February 22, 1960 at which time the aims and purposes were formulated as well as problems of programs, dues, tentative constitution discussed and a slate of officers selected for recommendation.

We owe a debt of gratitude to Mr. Harry Johnson of Johnson's Cactus Gardens for his suggested plans on types of programs, reference books, and other helpful ideas which he so willingly offered our new group.

Every effort was made to publicize our first meeting. Notices sent to 36 presidents of garden clubs in this area were read to their members; articles appeared in all suburban as well as two leading local newspapers, and invitations were mailed to approximately 130 interested persons.

On March 28, 1960 the first meeting of the Sacramento Cactus and Succulent Society was held in the new Sacramento Garden and Arts Center at 3330 McKinley Boulevard with 75 interested persons attending. Of this number, 63 joined the Society. At this time it was explained that the object of our society was to promote interest in the conservation and study of cacti and the other succulents and to encourage horticultural and scientific study of them. At our second regularly monthly meeting 125 attended when our membership jumped to 111, and 133 became members by the third meeting. Our Society is now 11 months old and we have 151 members.

One surprising fact reveals that interest in cacti and other succulents is not limited to the Sacramento area. We have members who attend from Placerville, Loomis, Clarksburg, Roseville, Lodi, Marysville and Yuba City. There is one couple who travel from St. Helena to attend our meetings.

We were amazed to learn the wealth of knowledge and experience that some members possessed. Among

our membership, we have a man who has spent over 25 years studying, collecting and propagating cacti and who specializes in cristates. Each month our Nomenclature Chairman presents some well-grown specimen which is designated as "Plant of the Month," and the members are briefed on the culture and habits of this particular plant. Programs made up of a panel of members to talk on their specialities and also to answer questions have proven very successful.

Our Society was given the opportunity to participate in an educational exhibit at the California State Fair last September. While only 50 potted specimens were required, with combined effort of our membership, we were able to display more than 200 specimen cacti and other succulents for which our Society received the blue ribbon.

In October, we held a show of specimen plants and arrangements which was attended by 140 members and guests. The show was put on by the members on a regular meeting night, and judges were on hand to comment on the specimens and arrangements. We were fortunate to have Professor H. M. Butterfield, Ralph E. Hillery and H. L. Bettencourt who came from Oakland to help with the judging.

Our Plant Table is a source of attraction to both members and visitors. A stipulated amount is spent each month to obtain small plants from local nurseries who specialize in cacti and other succulents. Members are encouraged to contribute their spare plants. This Plant Table is a means for many to add to their collections.

A library which was started last month with ten books promises to be most helpful. From time to time we plan to add to this collection, and all members are eligible to borrow from the library.

It is interesting to note that there are a great many men who grow cacti and other succulents, and their enthusiasm at the meetings is spontaneous. You see them gathered in a huddle comparing notes after the meetings. Everyone in our group seems to be happy to exchange ideas, and to visit one another's gardens.

Our group has great plans for this year. A bus trip to the Botanical Garden at Berkeley is planned. Many are looking forward to making field trips. Participation in the State Fair is expected, as well as our own membership show of specimens and arrangements in July. With our membership steadily growing, we hope to attract some well-known specialists from other areas to come and speak to us.

In summing up the evident success of our Society, interest in cacti and other succulents has been apparent for some time, and it took the impetus of a few to arouse into action the formation of the Sacramento Cactus and Succulent Society. If we can continue to offer our members programs that will increase their knowledge and interest in these plants, the future and continued success of our Society is assured.

Mrs. Marie K. Burns
Publicity Chairman
3332 Truckee Way
Sacramento 17, Cal.

BOOK REVIEW

Les Aloes de Madagascar, by G. W. Reynolds. Institut de Recherche Scientifique de Madagascar, Tananarive—Tsimbazaza. 1958.

Mr. Reynolds in his continuing studies of the genus *Aloe* has given us a very interesting work about the Aloes of Madagascar. Those who are familiar with his book, The Aloes of South Africa, can well realize that the same high level of research, observation in the field, and photography prevails in this little volume.

Most of the succulent plants of Madagascar have been comparatively little known in this country and this volume about the Aloes is very welcome at this time as many of the Madagascan Aloes have been introduced quite recently, and though it is a French publication the plant descriptions can be readily understood and it is well illustrated.

This work should be of great interest to those who have long been intrigued by the more or less unique but unattainable succulent plants of Madagascar. Many of the smaller Madagascan Aloes can be grown and flowered in a four inch pot and will prove fine additions to a greenhouse collection. *Aloe bakeri, A. millotii, A, parvula, A. bellatula, A. versicolor* and *Guillauminia albiflora (Aloe albiflora)* are the names of some of the smaller Aloes referred to.

Thanks are due to the Botanical Garden of the University of California at Berkeley and more recently to the International Succulent Institute of Millbrae, California for introducing many

Fig. 25
Aloe andringitrensis approx. X 0.10

Madagascan succulent plants including a very representative number of the Aloes which are, or will be in the near future, available to collectors.

Mr. Reynolds describes 38 species and 15 varieties of species. A key to the 8 groups into which they are arranged is given, beginning with the smaller species and ending with the tall caulescent Aloes represented by *Aloe vaombe, A. suzannae,* etc. He names several new species and renames others. This paper covered but finely printed volume of 156 pages is indexed, has 18 color plates and numerous black and white illustrations including an outline map of the island showing the principal stations cited. The introduction gives a brief history of the naming of the Madagascan Aloes and a short comparison with the Aloes of the mainland. J. R. BROWN

ED. NOTE: If you would like us to order you a copy, send $12.00 and allow three months.—S.E.H.

SPINE CHATS

LADISLAUS CUTAK

I'm sure you will be interested to hear what I accomplished on my recent trip to South America. Even though this expedition couldn't be called a cactus hunt, it nevertheless brought me in contact with a few cacti and succulents. First, I must tell you of my visit to the Dutch West Indies island of Curacao, which has been under Dutch control almost continuously since 1634. My visit to the island was most enjoyable in many ways and I regret only that equal time could not be spent on Aruba and Bonaire, its sister islands, lying close by.

I boarded KLM's Flying Dutchman at Miami and within an hour landed in Havana, where all passengers were required to get off and have their passports examined. This was a tense moment because we were led from the plane to a locked waiting room where we waited in hushed silence until the Cuban officials motioned for us to step forward. This procedure lasted about an hour and then we were again on our way: destination Kingston, Jamaica. It's marvelous how distances can be shortened by flying. When we got off at Kingston the air was quite sultry but Jamaica rum cooled us off, compliments of the local chamber of commerce. Too bad we only had time to partake of two delightful drinks. By nightfall we were on Aruba where we changed planes for Curacao, arriving around 7:30 p.m. Commander Nick Van Marle and his wife met me at the airport and invited me to their home for dinner. He is in charge of naval supplies for the Royal Dutch Navy in the islands. Later in the evening the naval officer took me on a sightseeing trip in Willemstad, the capital, and to Emmastad, where the oil refineries are located. These are the principal towns of the island where half of the total population works and lives.

Curacao is an island only thirty-eight miles long and eight miles across at its widest place. The rainfall is very low—averaging only about 20 inches a year and therefore presents a desert aspect remindful of wetsern Texas. The interior is desolate and bare with only a few characteristic tall plants dotting the landscape. The wind-blown divi-divi trees (Caesalpinia coriaria) are dominant and present a lopsided to flat-topped appearance due to the constant trade winds which blow over the island. Were it not for these perpetual zephyrs the island would be a much hotter and less liveable place. The island's population is made up mostly of negro ancestry because in the earlier days Curacao was not only a slave-trading center, but its large plantation holdings were worked by negro labor. The people appear to be industrious, are friendly, and talkative. Although Dutch is the official language, most of the natives speak Spanish, English and that curious *papiamento*, which is a common dialect composed of Dutch, Spanish, English and Afrikaans words.

During my stay on Curacao, I made my headquarters at the ultra-modern Hotel Curacao Intercontinental, a very nice hostelry situated within the walls of old Fort Amsterdam, which in the early days guarded the seaward approach to the town. Government offices are situated on one side of the picturesque old fortress and gaily painted houses of bright blue, pink, green, yellow and component shades line the waterfront and streets of Willemstad. The story is told that an early governor had been disturbed by the blinding tropical glare which hurt his eyes, so he ordered all houses to be painted in pastel shades. The buildings in Willemstad are typically Hollandaise with fine old Dutch gables and doorways. One late afternoon during a lull in a tropical rainstorm I was able to shoot a number of beautiful color pictures as the setting sun bathed the buildings with sunset colors and cast reflections in the water.

The topography of the island is rather interesting. The coastline, particularly on the west side, is notched with indented bays which are deep enough for large boats and ocean liners. The Schottegat is probably the best example of an inland bay, being connected on the lower or west end by a deep narrow channel, called Santa Anna Bay, which divides the town of Willemstad. A pontoon bridge, celebrated in travel folders, connects both ends of the town but during my visit the structure was being repaired and was not open to traffic. Curacao is also dotted with a number of sizable hills, the highest being St. Christoffelberg which towers over 1200 feet above the sea. Between Fuik Bay and Caracas Bay is Tafelberg or Table Hill, not quite as high—only 636 feet—to which area I was taken by Mrs. Van Marle on a plant hunt for cacti. This hill is a source of calcium phosphate which eventually is shipped abroad, after due processing, as fertilizer. The director of the mine lives at Santa Barbara Farm in a spacious mansion that overlooks the countryside. All kinds of tropical plants like bougainvillea, ixora, allamanda, and hibiscus are grown in profusion in his garden along with more of the commonly cultivated flowers like periwinkle, salvia, torrenia and coleus. After a cooling drink we walked about the Farm enjoying the native vegetation interspersed with plantings of coconut, banana and jak-fruit or breadnut.

Even though Curacao is a fairly barren and desolate

island when compared with other Caribbean islands, still one will find many interesting and colorful plants growing among the rocks. Wildflowers abound, sometimes carpeting stretches of land in all directions. Calabash trees are frequently spotted and at first put one in mind of Pereskias until the curious round hard-shelled fruits are noticed on the branches| Underneath the thorny scrub the low creeping *Opuntia curassavica* is found, producing oblong fragile joints that break easily upon contact. A taller, branched species, *O. wentiana,* grows in association with the common tree or torch cacti on the rocky terrain. Apparently, there are one or two other species but Opuntias do not hold too much fascination for me. Stands of *Cereus repandus* are common on the island, often forming thickets. One of the colored boys who drove me to the airport told me that his people frequently utilize the fleshy branches for food but I've forgotten how they prepare them. Another tall, tree-like cactus that makes a good show is *Pilocereus lanuginosus,* which sometimes is planted as a fence row. *Lemaireocereus griseus* serves the same purpose and its fruit is relished by the poorer people of Curacao. In the neighborhood of Caracas Bay I came across beautiful specimens of *Melocactus macracanthus* and wished I could have brought many of them home with me but I only mailed one to the Garden. This is a variable species as to size, shape of the plant body, length and color of spines and other slight deviations. The one I picked is spherical and with yellowish spines. Growing in company with it was *Mammillaria mammillaris* (or *simplex*). This is reputed to be one of the first cacti discovered and was in cultivation as early as 1688. I see I'm running out of space so intend to continue this report into the next issue of the JOURNAL. Thanks for your kind indulgence.

NOTICE TO AFFILIATES

Two new sets of 35mm slides have been deposited in the Slide Lending Library and are now available for loan.

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Please see page 129 of the July-August, 1960 issue of the Journal of the Cactus & Succulent Society of America for instructions on how to borrow these sets or write to:

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MARCH-APRIL 1961 OFFERING OF PLANTS BY THE INTERNATIONAL SUCCULENT INSTITUTE, INC.

(Please address all communications to the Secretary, J. W. Dodson, 921 Murchison Dr., Millbrae, Calif.)

The number of species we are distributing has increased to the point where it is no longer practical to describe them in detail in the Cactus Journal. Hereafter, just before or simultaneously with the appearance of each regular list in the Journal, we will send our past customers a separate list containing more complete descriptive and cultural notes; new customers will also receive this list with their plants. In this way our supporters will be benefited. In addition, the locality data and condensed descriptions will be published in the Journal, where they will be on permanent record. Other interested persons may secure the more complete list by sending a stamped, addressed envelope to the Secretary. In recent months the ISI has imported, or arranged to import, a vast amount of new or little-known succulents which we will propagate for later distribution. These include beautiful or curious species from Madagascar, Kenya, Tanganyika, Somaliland, South Africa, Guatemala and Mexico. Many choice, recently created hybrids will also be made available to you. The ISI will continue to be a thriving concern as long as there are enthusiasts to support it; your criticisms and suggestions are always welcome.

CACTI

ISI 184 *Cleistocactus micropetalus* Ritter *nom. nud.* A recently discovered species with beautiful, coarse, yellow spines and green flowers. Grown from seed collected by F. Ritter (#830), locality data not released. $1.50

ISI 185 *Disocactus ramulosus* (S.-D.) Kimn. A *Rhipsalis*-like epiphyte with flattened, pendent stems and small, white flowers and fruits; see drawing in Cact. Succ. Journ. Am. 33:13, 1961. UCBG 57.049, collected Jan. 20, 1957 by C. K. Horich at 1000 m. alt., near La Flor, 2 km. W. of Cachí, Prov. Cartago, Costa Rica, epiphytic with *Rhipsalis cassytha* and orchids. $1.25

ISI 250 *Epiphyllum caudatum* Britt. & Rose. One of the least-known Epiphyllum's, having long whip-like stems and flattened side-branches; the flowers are 6" long and nocturnal. UCBG 56.1122, collected by T. MacDougall (#A226) on rocks at 3000' alt., Guigovalaga, Dist. of Tehuantepec, Oaxaca, Mexico. $1.25

ISI 186 *Espostoa superba* Ritter. Seedlings of this new species are clothed in long, dense, white hairs that nearly hide the reddish spines. Grown from seed collected by F. Ritter (#572) in dense jungles at or near the type-locality, Jaen, northern Peru. $2.00

ISI 187 *Haageocereus aureispinus* Rauh & Back. A new and extremely beautiful species densely clothed in golden or reddish spines. We offer large seedlings (received last year by jet from Germany via the polar-route) grown at the University of Heidelberg from seed collected in 1956 by W. Rauh (#K170) at the type locality, 800-1200 m. alt., Canta Valley, Rio Chillon, central Peru. $1.75

ISI 188 *Nopalxochia ackermannii* (Haw.) Knuth X *Disocactus eichlamii* (Weing.) Britt. & Rose. A new hybrid with stems resembling an *Epiphyllum,* but with smaller, trumpet-shaped, purplish red flowers. UCBG 57.160, a hybrid by Myron Kimnach in 1956 of *N. ackermannii* (UCBG 51.1446) and *D. eichlamii* (UCBG 51.552—pollen parent). $1.25

ISI 189 *Trichocereus tropicus* Ritter *nom. nud.* Said to have slender, attractively tubercled stems and to need warm conditions (young plants in the rockery of the UC Botanical Garden in Berkeley were killed by 4 degrees of frost). This species is probably identical with *Rauhocereus riosaniensis* Back. *(Jaenocereus nigripilis* Johnson *nom. nud.)* Seedlings grown from seed collected by F. Ritter (#287) along the Rio Marañon, Peru. $1.50

ISI 190 *Weberbauerocereus longicomus* Ritter *nom. nud.* A new, white-spined, columnar cactus with a bristly cephalium. Seedlings grown from seed collected by F. Ritter (#656), probably in Peru. $1.50

OTHER SUCCULENTS

ISI 11 *Adromischus roaneanus* Uitew. Quickly form-

ing small bushes of zig-zag stems and silvery leaves; especially effective in a hanging basket. See Nat. Cact. Succ. Journ. [England] 7:76, 1952. The type-collection, UCBG 53.1128, collected by H. Herre (Stellenbosch 6058) at Van Rhynsdorp Pass, Steytlerville, S. Africa. $1.25

ISI 191 *Adromischus* sp. aff. *rotundifolius* (Haw.) Poelln. A small shrub with fleshy, rounded, greyish green leaves; a good pot-plant and fairly hardy. UCBG 54.309, collected by H. Hall (Stellenbosch 30008), 20 miles S. of Port Nolloth, Little Namaqualand, S. Africa. $ .75

ISI 192 *Agave guiengola* Gentry. A handsome new *Agave* found only near and on the ruins of the Zapotec fortress on Mt. Guiengola, Oaxaca. Plants are usually single and medium-sized, the leaves small-spined and a beautiful bluish white. See Cact. Succ. Journ. Am. 28:171, 1956, and 33:23, 1961. Seedlings collected by T. MacDougall (#442) on the East Pyramid of the pre-Colombian ruins on Cerro Guiengola, Tehuantepec, Oaxaca, Mexico. $1.50

ISI 193 *Agave utahensis* var. *nevadensis* Engelm. A very small *Agave*, distinct in its compactness, spiny margins and long terminal spine. See Cact. Succ. Journ. Am. 32: 23, 1960. Mature rosettes collected on blue limestone outcroppings at 5000′ alt., Mescal section of Ivanpah Mtns., vicinity of the pass on US Highway 91, San Bernardino Co., Calif. $1.75

ISI 194 *Ceropegia haygarthii* N. E. Brown. One of the best Ceropegia's, a vine with purple-spotted flowers surmounted by a strange antenna-like structure. The form we offer (illustrated in Cact. Succ. Journ. Am. 25: 102, 1953) is UCBG 50.2163, grown from seed collected by E. A. Pienaar in northern Transvaal, S. Africa. $1.50

ISI 320 *Cotyledon barbeyi* Schweinf. ex Penzig. A whitish leaved shrub, often tinged purple by the sun; ideal as a patio-plant and resistant to several degrees of frost. UCBG 53.541, collected by P. R. O. Bally at Mt. Kulal, Kenya. $1.25

ISI 195 *Dudleya candida* Britt. One of the most popular Dudleya's, forming small rosettes of snow-white leaves, excellent for growing in small containers. Plants collected June 21, 1960 by Reid Moran (#8306) on South Coronado Island, Baja California, Mexico. $1.00

ISI 196 *Echeveria heterosepala* Rose. An exceedingly rare species is often classified as a *Pachyphytum* because of its petal-appendages. The rosettes are somewhat like those of *E. microcalyx* and the flowers greenish. Our plants were grown from leaves of one of four specimens of Moran & Kimnach 7728, collected Nov. 15, 1959 at 6700′ alt., 1 mile N. of Santiago Acatepec (8.5 miles S.W. of Zapotitlan), near 18°15′N., 97°34′W., Puebla, Mexico; the plants grew in rubble on a gentle slope with *E. peacockii, E. nodulosa* and *Villadia ramosissima*. $1.50

ISI 197 *Echeveria semivestita* var. *floresiana* Walth. The leaves of this new variety are narrow, channeled, waxy and red-edged; the flower-buds are a striking shade of purplish blue. Bettencourt & Taylor 34, collected Feb. 1959 between Las Arbitos and Barbarita, on the Antiguo Morelos—San Luis Potosí road near the S.L.P.—Tamaulipas border, on rocks and trees with orchids and *Echeveria rosea*. $1.25

ISI 198 *Echeveria ?trianthina* Rose. A species which is still not exactly identified, small and easily kept in a 3-inch pot, with orange-yellow flowers and narrow leaves of a very distinctive bluish grey. Grown from seed collected by B. Wheelock (of Brownsville, Texas) 10 miles S. of Zimapan, Hidalgo, Mexico, on E. side of the Pan-American Highway, on hillside ca. 50′ from road. $1.25

ISI 199 *Euphorbia neohumbertii* Boit. One of the most outstanding Euphorbia's, a new introduction related to *E. lophogona* but with much thicker stems, wider leaves and bright red, stalkless flowers. We offer a small number of plants grown from seed of UCBG 54.1119, collected by Professor Humbert at Ankarana, N.E. Madagascar. $1.75 to $2.50

ISI 200 *Euphorbia pugniformis* Boiss. One of the rare and hard-to-propagate Euphorbia's with a globose main-stem and close-set, terminal branchlets, the whole plant protruding only several inches above-ground. Mature plants collected by S. Kitching from the new airfield of the Somerset East Flying Club, Somerset East, S. Africa, where they had been scraped up (but not damaged) by a bull-dozer; they grew in a rocky soil among karroo bushes and grass at 1800′ alt. $2.00 to $2.50

ISI 371 *Fockea crispa* (Jacq.) Schum. This is a famous succulent because a specimen grown in Austria since 1799 is the oldest pot-plant cultivated in Europe; it was also the only plant known until the recent rediscovery of this species. A tuberous relative of *Ceropegia* with a vining stem and attractive, wavy-edged leaves. Plants grown by M. Malherbe from seed collected by him in Barrydale District, S. Africa. $2.00

ISI 201 *Graptopetalum rushyi* (Greene) Rose. An extremely small member of the *Crassulaceae* with reddish, densely packed leaves and red-spotted flowers. UCBG 55.622, collected April 24, 1955 by E. R. Blakely (#B1933) at 3000′ alt., growing with *Selaginella* in silty loam ca. 50′ above the stream in Sabino Canyon, Santa Catalina Mtns., Pima Co., Arizona. $1.00

ISI 202 *Haworthia marumiana* Uitew. One of the smallest species, its toothed leaves speckled with transparent spots. Our plants are of the clonotype, collected by H. Herre (Stellenbosch 7773) at Mosselbay, S. Africa. $1.50

ISI 203 *Haworthia maughanii Poelln.* This is the most desired of all Haworthia's, and we are the first to offer it in the US. The leaves of this famous succulent are windowed and cut-off abruptly as though by a knife. See Cact. Succ. Journ. Am. 27: 67, 1955. Mature plants collected near the type locality, Calitzdorp, S. Africa. $2.75

ISI 323 *Huernia whitesloaneana* Nel. One of the tiniest and easiest-grown stapeliads, hardly 2″ high, with neat stems and reddish, bell-shaped flowers. We offer rooted cuts of a plant of the type collection, obtained from Scott Haselton, who received it from White and Sloane; originally collected in June, 1935 by Dr. G. C. Nel, 4500′ alt., the Forest Station on the Zoutpansberg, Transvaal, S. Africa (Stellenbosch Type No. 5720). $1.00

ISI 356 *Monadenium coccineum* Pax. A newly introduced member of the *Euphorbiaceae* with angled stems, fleshy, green leaves and a conspicuous, long-lasting, bright scarlet inflorescence. Rooted cuttings of a plant collected July 26, 1957 by P. R. O. Bally (#B11598) 6 miles S. of Endulen, toward Lake Eyassi, Masai Distr., North. Prov., Tanganyika. $1.50

ISI 204 *Sedum humifusum* Rose. One of the daintiest of succulents, ideal for bowl-plantings, with stalkless yellow flowers and forming a ½″ high mat of minute hairy rosettes. Kimnach & Moran 213, collected Dec. 1, 1959 on a steep river-bank beneath the Puente de Tasquillo, ca. 5400′ alt., 13 miles N. of Ixmiquilpan, Hidalgo, Mexico. $ .75

ISI 205 *Sedum spathulifolium* Hook. A wide-spread rock-plant of the western US. The 1″ rosettes are *Echeveria*-like and spread by runners. Collected in Jan. 1961 by Wayne Roderick 3.6 miles S. of Trinidad, Humboldt Co., California. $ .50

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